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Route to:

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Implementation of Chapter II of the Patent Cooperation Treaty

This notice is intended to be a summary of various notices published to implement Chapter II of the Patent Cooperation Treaty (PCT) on July 1, 1987.

1. *Withdrawal of reservation and implementing legislation.*

A copy of the withdrawal of the reservation as to Chapter II of the PCT under PCT Article 64(6)(b) and a copy of Public Law 99-616 implementing Chapter II of the PCT were published in the Official Gazette of May 12, 1987 at 1078 O.G. 10-13.

The proposed rule change relating to the implementation of Chapter II of the PCT was published on Mar. 4, 1987 in the Federal Register at 52 F.R. 6696-6707 and on Mar. 17, 1987 in the Official Gazette at 1076 O.G. 29-40. The final rules were published on May 28, 1987 in the Federal Register 52 F.R. 20038-20052 and on June 16, 1987 in the Official Gazette at 1079 O.G. 32.

A listing of all current member countries of the PCT was published on Mar. 3, 1987 at 1076 O.G. 3. After July 1, 1987 only Denmark, Norway, Liechtenstein, Switzerland and the Republic of Korea (South Korea) retain reservations as to Chapter II of the PCT.

A listing of the level of PCT fees effective July 1, 1987, both because of rulemaking and a change in the exchange rate was published on June 23, 1987 in the Official Gazette at 1079 O.G. 50.

A notice clarifying the requirements for entering the national stage in the United States under 35 U.S.C. 371 was published on Apr. 14, 1987 at 1077 O.G. 13.

2. *International Preliminary Examining Authorities*

The United States has informed the Director General of the World Intellectual Property Organization (WIPO) that the United States Patent and Trademark Office (USPTO) will serve as an International Preliminary Examining Authority for any international application filed in the United States Receiving Office and for any international application for which the USPTO has served as the International Searching Authority.

Applicants who have filed their international applications in the USPTO as a Receiving Office may choose to have the European Patent Office (EPO) serve as their International Preliminary Examining Authority *if* (1) the EPO has served as the International Searching Authority for the international application and (2) the demand filed with the EPO is one of the first 500 demands filed by applicants who have filed their international applications in the United States Receiving Office in one of the 3 years beginning July 1, 1987.

The attention of applicants desiring to use the EPO as an International Preliminary Examining Authority is also directed to the notice titled "Information for PCT applicants concerning the procedure before the EPO as an International Preliminary Examining Authority under Chapter II of the PCT" published in the Official Journal of the European Patent Office in volume 12/1986 at pages 441–445.

A copy of the "Memorandum of Understanding" to monitor the number of demands filed in the EPO by U.S. applicants between the USPTO and EPO appears below.

DONALD J. QUIGG,
June 11, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks United States Patent and Trademark Office.*

Memorandum of Understanding

Procedures for monitoring and processing demands submitted to the European Patent Office by U.S. applicants who filed their international applications with the United States Receiving Office.

Purpose

The purpose of this memorandum is to set forth the procedures to be used to monitor the number of demands for international preliminary examination filed by U.S. applicants in the European Patent Office (EPO) in respect of international applications filed with the United States Receiving Office (hereinafter referred to as "demands filed in the EPO by U.S. applicants"). Such monitoring is important in view of the limit of 500 international preliminary examination reports which the EPO has agreed to establish during each of the first three years that PCT Chapter II is in effect as to the United States of America. The memorandum also sets forth the processing procedures for any demands filed in excess of the agreed to-amount.

Monitoring of Number of Demands

It is essential that U.S. applicants be informed as to the number of demands which have already been filed in the EPO by U.S. applicants, especially where the number of demands filed in the EPO is approaching 500.

In order to provide such numerical information to the U.S. applicants, the EPO will provide to the USPTO, each month during the first three years by telex, the cumulative number of demands filed in the EPO by U.S. applicants during that particular year. The USPTO will then publish a notice which indicates the number of demands filed in the EPO by U.S. applicants as of a particular date, in its Official Gazette. The number of demands filed, based upon the latest known information, will also be supplied by telephone or telex to interested persons by both the EPO and USPTO.

Processing of Demands in Excess of 500

Since the EPO will only accept 500 demands a year from U.S. applicants, the USPTO will accept any demands beyond the 500 limit filed in the EPO by U.S. applicants.

Upon receipt by the EPO of the 501st and subsequent demands from a U.S. applicant, the EPO will promptly notify the applicant that it is not competent under PCT Rule 59.1 to receive the demand. The EPO will also immediately telex or telephone the USPTO and inform it of the international application serial number so that the USPTO may make immediate contact with the applicant.

The EPO will refund any fees paid by the applicant to the EPO and indicate that only the USPTO is competent to receive the demand and establish the international preliminary examination report, and that the demand is being forwarded to the USPTO. The EPO will indicate the date of receipt of the demand on the demand and promptly forward it to the USPTO for further processing. The EPO will be considered to be the agent of the USPTO for purposes of receiving and dating demands. The USPTO will correspond with the applicant concerning the demand and require the payment of fees to the USPTO under PCT Rules 57.4 and 58.2.

For purposes of this procedure, the contact person in the USPTO is Louis O. Maassel (telephone 703–557–3070) and the contact person in the EPO is Mr. Colin Philpott (telephone 2399–2479) for substantive and organizational matters, or Mrs. M. Houyez-Stevens (telephone 2399–2423) for numerical information.

PAUL BRAENDLI
President,
European Patent Office.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks United States Patent and Trademark Office.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 3, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,457,023 through 4,458,362
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 19, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,380,092	06/238,223	4/19/83
4,380,096	06/283,067	4/19/83
4,380,120	06/232,503	4/19/83
4,380,121	06/249,971	4/19/83
4,380,126	06/269,726	4/19/83
4,380,131	06/216,849	4/19/83
4,380,157	06/281,366	4/19/83
4,380,159	06/255,474	4/19/83
4,380,160	06/228,067	4/19/83
4,380,165	06/266,280	4/19/83
4,380,176	06/231,511	4/19/83
4,380,177	06/223,524	4/19/83
4,380,186	06/297,629	4/19/83
4,380,190	06/234,878	4/19/83
4,380,201	06/242,288	4/19/83
4,380,206	06/247,484	4/19/83
4,380,213	06/342,802	4/19/83
4,380,215	06/284,064	4/19/83
4,380,227	06/380,081	4/19/83
4,380,231	06/229,764	4/19/83
4,380,233	06/221,469	4/19/83
4,380,236	06/301,677	4/19/83
4,380,238	06/294,915	4/19/83
4,380,242	06/267,998	4/19/83
4,380,245	06/228,629	4/19/83
4,380,246	06/245,844	4/19/83
4,380,247	06/250,203	4/19/83
4,380,255	06/294,216	4/19/83
4,380,268	06/281,718	4/19/83
4,380,269	06/319,043	4/19/83
4,380,270	06/227,754	4/19/83
4,380,271	06/255,129	4/19/83
4,380,290	06/252,384	4/19/83
4,380,293	06/216,327	4/19/83
4,380,294	06/231,661	4/19/83
4,380,302	06/254,939	4/19/83
4,380,305	06/329,258	4/19/83
4,380,326	06/301,937	4/19/83
4,380,331	06/231,160	4/19/83
4,380,339	06/292,608	4/19/83
4,380,344	06/269,996	4/19/83
4,380,374	06/254,947	4/19/83
4,380,380	06/272,506	4/19/83
4,380,382	06/274,555	4/19/83
4,380,409	06/293,165	4/19/83
4,380,410	06/243,432	4/19/83
4,380,414	06/264,284	4/19/83
4,380,421	06/317,599	4/19/83
4,380,422	06/270,973	4/19/83
4,380,425	06/234,597	4/19/83
4,380,437	06/299,335	4/19/83
4,380,439	06/299,840	4/19/83
4,380,493	06/320,121	4/19/83
4,380,500	06/322,731	4/19/83
4,380,539	06/242,583	4/19/83
4,380,545	06/245,288	4/19/83
4,380,547	06/268,416	4/19/83
4,380,560	06/331,487	4/19/83
4,380,562	06/235,681	4/19/83
4,380,565	06/338,020	4/19/83
4,380,568	06/246,411	4/19/83
4,380,571	06/369,786	4/19/83
4,380,610	06/332,416	4/19/83
4,380,613	06/279,905	4/19/83
4,380,614	06/222,924	4/19/83
4,380,624	06/288,763	4/19/83
4,380,634	06/308,014	4/19/83
4,380,640	06/224,583	4/19/83
4,380,642	06/284,398	4/19/83
4,380,645	06/329,842	4/19/83
4,380,661	06/237,196	4/19/83
4,380,678	06/226,998	4/19/83
4,380,691	06/301,224	4/19/83
4,380,700	06/278,137	4/19/83
4,380,721	06/221,085	4/19/83
4,380,727	06/247,515	4/19/83
4,380,730	06/261,259	4/19/83
4,380,778	06/260,712	4/19/83
4,380,784	06/242,923	4/19/83
4,380,787	06/303,861	4/19/83
4,380,788	06/262,656	4/19/83
4,380,791	06/267,413	4/19/83
4,380,818	06/267,664	4/19/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the

indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,513,986, Re. S.N. 045,052, Filed Apr. 30, 1987, Cl. 280/281R, BICYCLE FRAME, James L. Trimble, Owner of Record: *Inventor,* Attorney or Agent: John N. Williams, Ex. Gp.: 316

4,517,172, Re. S.N. 049,331, Filed May 13, 1987, Cl. 424/7.1, PLAQUE DISCLOSING AGENT, George L. Southard, Owner of Record: *Vipont Laboratories, Inc., Ft. Collins, Colo.,* Attorney or Agent: Eric P. Schellin, Ex. Gp.: 128

4,517,268, Re. S.N. 045,346, Filed May 4, 1987, Cl. 430/39, PROCESS FOR MAGNETIC IMAGE CHARACTER RECOGNITION, Robert J. Gruber, et al., Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: Ronald Zibelli, et al., Ex. Gp.. 156

4,566,376, Re. S.N. 007,807, Filed Jan. 27, 1987, Cl. 99/468, SYSTEM FOR PRODUCING CRISP FRUIT CHIPS, A. Webb Wells, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 242

4,569,561, Re. S.N. 049,382, Filed May 13, 1987, Cl. 305/40, ENDLESS DRIVE SYSTEM, John W. Edwards, et al., Owner of Record: *Harper, Harper, et al., Fort Meyers, Fla.,* Attorney or Agent: Roger W. Parkhurst, Ex. Gp.: 312

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 31,640, Reexam. No. 90/001,235, Requested: May 8, 1987, Cl. 3/13, BUOYANCY INTRAOCULAR LENS DEVICE, Dr. Jerre Freeman, Owner of Record: *Inventor, Memphis, Tenn.,* Attorney or Agent: Baker & McKenzie, Ex. Gp.: 330, Requester: 3M Co., St. Paul, Minn.

4,166,968, Reexam. No. 90/001,246 Requested: May 26, 1987, Cl. 310/239, ELECTRICAL Y ISOLATED BRUSH HOLDER, Robert L. Pritt[illegible] Owner of Record: *Lear Siegler, Inc., Santa Monica, Calif.,* Attorney or Agent: Pearne, Gordon, et al., Ex. Gp.: 210, Requester: Owner

4,369,013, Reexam. No. 90/001,243, Requested: May 12, 1987, Cl. 412/38, BOOKBINDING STRIPS, William Abildgaard, et al., Owner of Record: *Velo-Bind, Inc., Sunnydale, Calif.,* Attorney or Agent: Unknown, Ex. Gp.: 320, Requester: Owner

4,497,520, Reexam. No. 90/001,242, Requested: May 18, 1987, Cl. 299/86, ROTATABLE CUTTER BIT, Randle W. Ojanen, Owner of Record: *GTE Products Corp., Stamford, Conn.,* Attorney or Agent: Donald R. Castle, Ex. Gp.: 250, Requester: Kennametal, Inc., Latrobe, Pa.

4,571,331, Reexam. No. 90/001,244, Requested: May 21, 1987, Cl. 423/345, ULTRAFINE POWDER OF SILICON CARBIDE, A METHOD FOR THE PREPARATION THEREOF AND A SINTERED BODY THEREFROM, Morinobu Endou, et al., Owner of Record: *Shin-Etsu Chemical Ltd., Tokyo, Japan,* Attorney or Agent: Hill, Van Santen, et al., Ex. Gp.: 220, Requester: Raymond W. Green, Chicago, Ill.

4,588,580, Reexam. No. 90/001,245, Requested: May 26, 1987, Cl. 424/21, TRANSDERMAL ADMINISTRATION OF FENTANYL AND DEVICE THEREFORE, Robert M. Gale, et al., Owner of Record: *Alza Corp., Palo Alto, Calif.,* Attorney or Agent: Steven F. Stone, Ex. Gp.: 150, Requester: Owner

4,592,353, Reexam. No. 90/001,247, Requested: May 19, 1987, Cl. 128/303.100, MEDICAL AND SURGICAL LASER PROBE, Norio Daikuzono, Owner of Record: *Surgical Laser Technology Ohio, Inc., Cincinnati, Ohio,* Attorney or Agent: McDougall, Hersh, et al., Ex. Gp.: 330, Requester: W. Edward Johansen, Los Angeles, Calif.

4,593,044, Reexam. No. 90/001,248, Requested: May 22, 1987, Cl. 514/557, INJECTABLE SOLUTION FOR THE TREATMENT OF INFLAMMATIONS, Gunter Metz, Owner of Record: *Merckle GmbH, Blaubeuren, Germany,* Attorney or Agent: Jeffery L. Ihnen, Ex. Gp.: 150, Requester: Fernanda Fiordalisi, Garden City, N.Y.

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,666,425, Reexam. No. 90/001,249, Ordered: June 1, 1987, Cl. 604/4, DEVICE FOR PERFUSING AN ANIMAL HEAD, Chet Fleming, Owner of Record: *The Dis Corp., St. Louis, Mo.,* Attorney or Agent: Patrick D. Kelly, Ex. Gp.: 330, Requester: The Commissioner of Patents & Trademarks, Washington, D.C.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Apple Investments Inc.,Beverly Hills, Calif., Reg. No. 1,181,482, for the mark "APPLE INVESTMENT INC. AND DESIGN", Canc. No. 16,016.

Biloxi Canning & Packing Co., Inc., Biloxi, Miss., Reg. No. 876,133, for the mark "BILOXI", Canc. No. 16,171.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Patent and Trademark Office
Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons in-

terested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO–87–A6–chemical technology, PTO–87–A7–electrical technology, and PTO–87–A8–mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

Duties: Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interfering parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

(1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
(2) to declare and to conduct proceedings in interferences; and
(3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

Qualification requirements: In addition to a technical degree, candidates must possess:

(1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
(2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;
(3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
(4) A high degree of demonstrated competence and knowledge of interference law and practice;
(5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
(6) Demonstrated ability to write clearly, and to write logically developed opinions;
(7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
(8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
(9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

Factors which will be considered in evaluating qualified candidates: Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

Interested candidates should submit the following:

(1) Personal Qualifications Statement, SF–171;
(2) Merit Program Interest Statement, CD–261 (PTO employees only);
(3) Current supervisory appraisal on your agency's form or on CD–362 (letters of reference for outside candidates);
(4) Annual narrative performance rating, or equivalent;
(5) Examiner-in-Chief Questionnaires; and
(6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557–3631.

DONALD W. PETERSON,
Deputy Assistant Secretary and Deputy Commissioner or Patents and Trademarks.

Feb. 3, 1987.

PATENT NOTICES

Certificates of Correction for the Week of July 7, 1987

D. 287,408	4,616,029	4,636,451	4,646,139
D. 287,642	4,617,332	4,636,616	4,646,622
D. 289,135	4,617,752	4,636,627	4,647,293
3,974,883	4,618,518	4,636,662	4,647,529
4,474,110	4,619,960	4,636,840	4,647,568
4,499,081	4,621,076	4,637,684	4,647,579
4,507,415	4,621,241	4,637,708	4,647,604
4,511,882	4,621,299	4,637,859	4,647,625
4,527,662	4,621,512	4,637,911	4,647,687
4,529,789	4,621,643	4,638,730	4,647,777
4,531,810	4,622,686	4,639,548	4,648,193
4,544,681	4,623,272	4,640,475	4,648,271
4,547,641	4,624,533	4,640,592	4,648,414
4,548,948	4,624,649	4,640,634	4,649,127
4,554,101	4,624,895	4,640,930	4,649,205
4,555,332	4,625,429	4,641,475	4,649,451
4,560,682	4,625,699	4,641,665	4,649,563
4,568,269	4,625,992	4,641,906	4,650,362
4,570,010	4,626,433	4,642,102	4,650,500
4,571,441	4,626,544	4,642,277	4,650,685
4,572,473	4,626,581	4,642,658	4,650,869
4,573,430	4,628,703	4,642,681	4,651,380
4,574,093	4,628,902	4,642,771	4,651,535
4,577,105	4,629,171	4,642,879	4,652,005
4,577,770	4,629,183	4,643,518	4,652,497
4,583,986	4,629,264	4,643,542	4,653,117
4,591,582	4,629,532	4,643,776	4,653,216
4,594,193	4,630,738	4,643,788	4,653,446
4,595,868	4,630,922	4,643,989	4,653,662
4,600,231	4,632,131	4,644,083	4,655,064
4,600,329	4,632,900	4,644,492	4,655,077
4,601,551	4,633,075	4,644,822	4,655,246
4,602,051	4,634,227	4,645,094	4,655,696
4,605,450	4,634,948	4,645,386	4,656,017
4,606,987	4,634,973	4,645,579	4,656,156
4,611,259	4,636,312	4,645,593	4,657,446
4,611,718	4,636,359	4,645,776	4,658,281
4,612,299	4,636,409	4,645,828	

Disclaimers

4,327,792.—*Samuel P. Landers*, Uniontown, Ohio. SPREADING NOISE GENERATED BY LOAD SUPPORTING ELEMENTS. Patent dated May 4, 1982. Disclaimer filed May 6, 1987, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby enters this disclaimer to claims 4, 6, 7, 8, 9, 11, 12, 18, 20, 26, 28, 29, 30, 31, 32, 37, 42, 44, 45, 46, 47 and 48 of said patent.

4,474,223.—*Samuel P. Landers*, Uniontown, Ohio. SPREADING NOISE GENERATED BY LOAD SUPPORTING ELEMENTS OF A TIRE TREAD. Patent dated Oct. 2, 1984. Disclaimer filed May 6, 1987, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby enters this disclaimer to claims 1 and 24 of said patent.

4,501,765.—*Peter J. Towersey*, High Wycombe, *John Longton*, Chesham and *Geoffrey N. Cockram*, Remenham Hill, England. PRODUCTION OF EDIBLE PROTEIN-CONTAINING SUBSTANCES. Patent dated Feb. 26, 1985. Disclaimer filed Mar. 20, 1986, by the assignee, *Ranks Hovis McDougall PLC* .

The term of this patent subsequent to Aug. 8, 1994 has been disclaimed.

4,522,233.—*Yousef Mojadad*, Lenexa, Kans. MULTI-POSITION PLUG VALVE. Patent dated June 11, 1985. Disclaimer filed May 8, 1987, by the assignee, *Smith & Loveless, Inc.*

Hereby enters this disclaimer to claims 1-4 and 8 of said patent.

4,571,925.—*Jerryl Adams*, Easton, Pa. INSERTION MACHINE WITH POSTAGE CATEGORIZATION. Patent dated Feb. 25, 1986. Disclaimer filed Apr. 16, 1987, by the assignee, *Bell & Howell Co.*

Hereby enters this disclaimer to claims 1-9, 12-14 and 19-35 of said patent.

4,609,662—*Thomas A. Krenitsky*, Chapel Hill, N.C. METHOD FOR USING PURINE DERIVATIVES. Patent dated Sept. 2, 1986. Disclaimer filed Apr. 6, 1987, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to claims 3, 4, 6, 8, 11 and 12 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
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	Miami–Dade Public Library	(305) 375-2665
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	Springfield: Illinois State Library	(217) 782-5430
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Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 23, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-06-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	4-15-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-08-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-07-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-14-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-22-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-07-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during May 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,599,579 to 3,514,783, inclusive

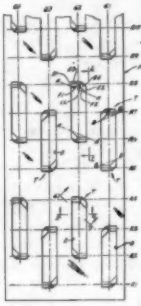
Plant Patents ..... None

REEXAMINATIONS

JULY 7, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,951,033 (713th)
CONNECTOR PLATE
Walter G. Moehlenpah, St. Louis, Mo., assignor to Moehlenpah Industries, Inc., Coeur, Md.
Reexamination Request No. 90/000,818, Jul. 8, 1985.
Reexamination Certificate for Patent No. 3,951,033, issued Apr. 20, 1976, Ser. No. 541,606, Jan. 16, 1975.
Int. Cl.[4] F16B *15/00*
U.S. Cl. 411—468



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–11** are cancelled.

New claim **12** is added and determined to be patentable.

12. A connector for securing together adjacent wood members of a wood structure comprising a plate of mild commercial steel or the like having a plurality of elongate openings arranged in columns extending longitudinally of the plate, each said opening having elongate struck-out portions of the plate extending generally perpendicular to one face of the plate at each end of the opening, the struck-out portions constituting elongate teeth, said openings in each said column being spaced at substantially equal intervals relative to one another in the direction of the column and said columns being spaced transversely across the plate at substantially equal intervals, each said tooth having a shank portion and a pointed tip portion terminating at the free end of the tooth and being generally channel-shaped in cross section with the side edges of the shank portion being substantially parallel, both teeth of certain openings being so oriented relative to the longitudinal axes of their respective columns that vertical planes tangent to portions of said teeth side edges toward said certain openings are skewed in one direction at a first predetermined angle with respect to said longitudinal axes of their respective columns and both of the teeth of certain others of said openings being so oriented relative to the longitudinal axes of their respective columns that vertical planes tangent to portions of the side edges of these latter teeth are skewed at a second predetermined angle substantially equal in magnitude but opposite in direction to said first predetermined angle, each said tooth being a substantial duplicate of the tooth at the opposite end of its respective opening with both teeth in one opening being skewed at the same angle and in the same direction, said plate being a flat generally rectangular plate and the longitudinal axes of said elongate openings being generally aligned with longitudinal axes of said columns, said teeth being skewed substantially along their entire lengths with respect to the longitudinal axes of their respective openings.

B2 3,964,405 (714th)
PERENNIAL WEED CONTROL BY DEEP PLACEMENT OF VOLATILE SOIL FUMIGANTS
William A. Haglund, P.O. Box 693, Mount Vernon, Wash. 98273, and Theodore P. Reiling, 500 Boright, Apt. 101, Le Sueur, Minn. 56058
Reexamination Request No. 90/000,824, Jul. 22, 1985.
Reexamination Certificate for Patent No. 3,964,405, issued Jun. 22, 1976, Ser. No. 121,576, Mar. 5, 1971.
Reexamination Certificate B1 3,964,405, issued Sep. 23, 1986.
Int. Cl.[4] A01C *23/02*
U.S. Cl. 111—6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **14–19** is confirmed.

Claims **1–13** were previously cancelled.

14. A method of controlling deep-rooted perennial weeds, such as field bindweed and Canada thistle, comprising:
penetrating the soil to be treated to a depth of at least 14 and up to 24 inches below the soil surface at horizontal spacings ranging from 16 to 30 inches with spaced implements secured for movement through the soil; and
injecting a volatile soil fumigant selected from the group consisting of 1,3 dichloropropene, methylbromide, ethylene bromide and mixtures of the foregoing through the implements into the soil at depths of at least 14 and up to 24 inches below the soil surface and a rate of 2½ to 30 gallons per acre while moving the implement through the soil of the area to be treated.

B2 3,995,018 (715th)
METHOD OF BINDING IMMUNOGLOBULIN EMPLOYING A POLYPEPTIDE FROM MICROORGANISMS
John A. Sjöquist, Uppsala, Sweden, assignor to Pharmacia Aktiebolag, Uppsala, Sweden
Reexamination Request No. 90/001,075, Aug. 27, 1986.
Reexamination Certificate for Patent No. 3,995,018, issued Nov. 30, 1976, Ser. No. 409,572, Oct. 25, 1973.
Reexamination Certificate B1 3,995,018, issued Jun. 24, 1986.
Claims priority, application Sweden, Nov. 6, 1972, 14330/72; Feb. 8, 1973, 7301779
Int. Cl.[4] G01N *33/53, 33/563, 33/544, 33/545*
U.S. Cl. 435—7

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

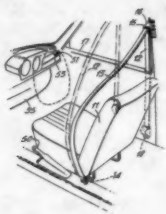
1. In the method of binding, in the presence of an aqueous liquid, at least one immunoglobulin or its free Fc-fragment to a polymer insoluble in said aqueous liquid with the assistance of a substance attached to the polymer by contacting said polymer with the substance attached thereto with said immunoglobulin or its free Fc-fragment in the aqueous liquid, the improvement which comprises using at least one polypeptide from Staphylococci as said substance attached to said polymer, said immunoglobulin being from the IgG-class and said polypeptide being able to bind at least one immunoglobulin from the IgG-class at the Fc-part of the said immunoglobulin.

B1 4,040,645 (716th)

SEAT-BELT APPARATUS

William McAlpin Giffin, Hailey, England; John Michael Pollitt, Gretna, Scotland, and Roy Clifford, Carlisle, England, assignors to Auto Restraint Systems Limited, London, England

Reexamination Request No. 90/000,600, Aug. 3, 1984.
Reexamination Certificate for Patent No. 4,040,645, issued Aug. 9, 1977, Ser. No. 585,426, Jun. 9, 1975.
Claims priority, application United Kingdom, Jun. 10, 1974, 25703/74
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—803



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5**, **7** and **8** is confirmed.

Claim **6** is determined to be patentable as amended.

New claims **9–13** are added and determined to be patentable.

1. A seat-belt apparatus of the kind which is arranged to be mounted in a vehicle for automatically moving a seat-belt of the apparatus into, and away from, an operative position across a vehicle seat comprising,

a seat-belt retraction mechanism mounted on a vehicle door adjacent said seat,

means coupling said seat-belt to the retraction mechanism to permit withdrawal of the seat-belt from the retraction mechanism,

said retraction mechanism including acceleration responsive means operable to inhibit withdrawal of the seat-belt from the retraction mechanism when said mechanism is subjected to an acceleration in excess of a predetermined magnitude and to permit such withdrawal at all other times,

and means responsive to the position of said door for permitting said acceleration-responsive means to inhibit withdrawal of the seat-belt only when said door is closed and to prevent such inhibition whenever the door is open.

B1 4,257,674 (717th)

ELASTOMERIC FIBER OPTIC SPLICE

Wendell L. Griffin, Warren, Pa.; W. John Carlsen, Natick, Mass., and John E. Benasutti, Oil City, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Reexamination Request No. 90/000,979, Apr. 3, 1986.
Reexamination Certificate for Patent No. 4,257,674, issued Mar. 24, 1981, Ser. No. 32,583, Apr. 23, 1979.
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21

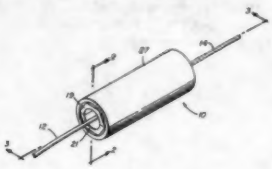
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **7** is cancelled.

Claims **1** and **8** are determined to be patentable as amended.

Claims **2–6**, dependent on an amended claim, are determined to be patentable.

1. A splice for holding the ends of optical fibers in end to end relationship comprising a fiber receiving member having an external polygonal shaped surface and formed by a pair of sections, said sections having complimentary and mating planar surfaces in engagement, only one of said planar surfaces having an axially aligned groove therein and facing the other of said planar surfaces to form an opening therewith, said fiber



receiving member comprising an elastomeric material of sufficient resilience to permit said opening to expandably receive optical fibers dimensioned larger than said opening, and a cylindrically shaped sleeve mounted about said receiving member for holding said sections in assembled relationship, *said sleeve having an internal surface defined as a substantially continuous curve having an internal radius of curvature smaller than the distance from the axial center of the receiving member to a corner thereof.*

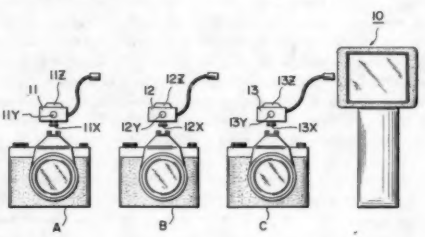
8. A splice according to claim **[7]** *6* wherein said receiving member comprises a transparent material.

B1 4,329,624 (718th)

COMPUTER TYPE ELECTRONIC PHOTOFLASH

Akio Kamon, Koganei; Sakyo Nagashima, Kawasaki, and Yuzo Tsuruta, Yokohama, all of Japan, assignors to Kabushiki Kaisha Sunpak, Tokyo, Japan

Reexamination Request No. 90/000,937, Jan. 13, 1986.
Reexamination Certificate for Patent No. 4,329,624, issued May 11, 1982, Ser. No. 110,126, Jan. 7, 1980.
Claims priority, application Japan, Mar. 17, 1979, 54-34759[U]; Mar. 19, 1979, 54-34399[U]
Int. Cl.[4] H05B *41/32*; G03B *15/05*
U.S. Cl. 315—151



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **2** are cancelled.

[1. An adapter for interconnecting a camera and a flash unit wherein the flash unit includes a capacitor, a flash tube, discharge means for discharging said capacitor through said flash tube, and flash-termination means for terminating the discharge of said capacitor through said flash tube, said adapter comprising a set of camera terminals for connection to said camera, a set of flash unit terminals for connection to said flash

unit, synchronizing means coupling said camera and flash unit terminals for conveying a synchronizing signal from said camera to said photoflash unit for initiating operation of said discharge means, photometric means in said adapter for responding to reflection of light developed by said flash unit, and a terminal for said adapter for connection to a terminal of said flash unit for conveying a signal from said photometric means to said flash termination means to initiate operation thereof.]

B1 4,529,787 (719th)

BULK POLYMERIZATION PROCESS FOR PREPARING HIGH SOLIDS AND UNIFORM COPOLYMERS

Ronald E. Schmidt; Harold H. Schultz, and Dennis M. Wilson, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Reexamination Request No. 90/001,000, Apr. 26, 1986.
Reexamination Certificate for Patent No. 4,529,787, issued Jul. 16, 1985, Ser. No. 388,764, Jun. 15, 1982.
Int. Cl.[4] C08F *2/02*
U.S. Cl. 526—209

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–18** is confirmed.

1. Bulk polymerization process for preparing enhanced yields of high solids, low molecular weight vinylic polymer product having a narrow molecular weight distribution and a low chromophore content comprising the steps of continuously:

(a) charging into a continuous mixed reactor zone containing a molten resin mixture;

(i) a mixture of vinyl monomers comprising at least one monoalkenyl aromatic monomer and at least one acrylic monomer;

(ii) a polymerization initiator in amounts to provide a molar ratio of said initiator to said mixture of vinyl monomers from about 0.0005:1 to 0.04:1;

(iii) from about 0 to 25 percent based on the weight of vinyl monomers of a reaction solvent, wherein said molten resin mixture comprises unreacted vinylic monomers and the vinylic polymer product;

(b) maintaining a flow rate through said reaction zone sufficient to:

(i) provide a residence time of said charged vinylic monomer mixture in said reaction zone of from about two minutes to one hour; and

(ii) maintain a predetermined level of reaction mixture in said reaction zone, and;

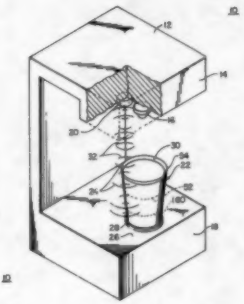
(c) maintaining the molten resin mixture at a reaction temperature within the range from about 180° C. to 270° C. sufficient to provide accelerated conversion to a readily processable, uniform, concentrated polymer product having a number average molecular weight of 500 to 6000, a polydispersity ratio of less than about 2.5 and a dispersion index of less than about 4.5.

B1 4,572,253 (720th)

AUTOMATIC LEVEL SENSING SYSTEM

M. Zane Farmer, and Diane B. Farmer, both of 12 Christmas Tree Dr., Ashburnham, Mass. 01430

Reexamination Request No. 90/001,078, Sep. 3, 1986.
Reexamination Certificate for Patent No. 4,572,253, issued Feb. 25, 1986, Ser. No. 632,375, Jul. 19, 1984.
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—95



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **13**, **14**, **21**, **22** and **24** are cancelled.

Claims **1**, **6**, **7**, **9**, **17**, **18** and **25** are determined to be patentable as amended.

Claims **2–5**, **8**, **10–12**, **15**, **16**, **19**, **20**, and **23**, dependent on an amended claim, are determined to be patentable.

New claims **26–30** are added and determined to be patentable.

1. A level sensing system comprising:

ultrasonic sound wave [trasducer] *transducer* means for emitting ultrasonic sound waves and for receiving ultrasonic sound waves reflected from a receptacle whose content level is to be sensed;

a content level detector, responsive to said reflected ultrasonic sound waves, for detecting the level of the contents of the receptacle[;] *by sensing reflected ultrasonic sound waves having a signal level greater than a first reference level;*

a rim detector, responsive to said reflected ultrasonic sound waves, for determining the location of the rim of the receptacle[; and] *by sensing reflected ultrasonic sound waves having a signal level greater than a second reference level which is different from said first reference level; and*

a level comparator, responsive to said rim detector and said content level detector, for comparing the contents level with the rim location for indicating when the contents level is within a predetermined distance of the rim.

STATUTORY INVENTION REGISTRATIONS

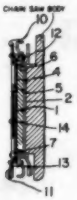
PUBLISHED JULY 7, 1987

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H294
SAW CHAIN GUIDE DEVICE FOR CHAIN SAW

Junichi Hiraizumi, Tokyo, and Akira Nagashima, Kawasaki, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 702,243
Claims priority, application Japan, Feb. 17, 1984, 59-21297
Int. Cl.[4] B23D *57/02, 59/00;* **B27B** *17/00*
U.S. Cl. 30—383 **2 Claims**

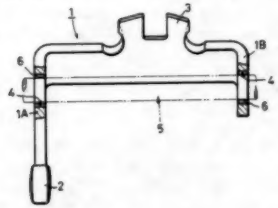


1. A saw chain guide device for a chain saw comprising a guide bar disposed adjacent to a drive sprocket for a saw chain and first and second side plates having generally planar body portions and mounted on opposite sides of the guide bar, respectively, for guiding a saw chain travelling along side edges of said guide bar, said first side plate having said drive sprocket disposed between itself and said second side plate, said first side plate defining a circular bore concentric with and having a diameter slightly greater than a tooth tip circle of said drive sprocket, said circular bore having an end edge portion about the periphery thereof, wherein an end face of each of said sides terminates adjacent to a tooth tip circle of the drive sprocket of the saw chain, and said end edge portion extending about the periphery of said circular bore terminates in close proximity to said tooth tip circle of the toothed sprocket and is integrally formed with said first side plate and each said side plate (1,2) having upper and lower edge portions (10,11 and 22,23) flanged from the general plane of said side plate body portions away from said guide bar.

H295
SHIFT FORK SUPPORT STRUCTURE IN A MANUAL TRANSMISSION

Akio Numazawa, Nagoya; Hajime Arai, Aichi; Shozi Haga, and Tadashi Nozaki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 453,904, Dec. 28, 1982, abandoned.
This application Oct. 1, 1985, Ser. No. 782,172
Claims priority, application Japan, Oct. 22, 1981, 56-158461[U]
Int. Cl.[4] B60K *20/00;* **F16C** *33/20*
U.S. Cl. 74—473 R **3 Claims**



1. A shift fork for an automotive vehicle manual transmission, said shift fork being axially movable relative to a fork shaft, said shift fork comprising:

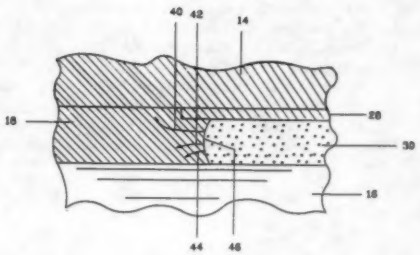
a. a pair of spaced, coaxial openings for slidably receiving said fork shaft, the axial length of the peripheries of said openings being less than the diameter of said fork shaft; and

b. a bushing press-fitted in each said opening, each said bushing including a polytetrafluorethelene layer coating the inner peripheral surface thereof, said polytetrafluorethelene layer being disposed for slidable contact with said fork shaft, said bushings having axial lengths equal to said openings.

H296
ELASTIC PULLER SABOT FOR SMALL CALIBER FLECHETTE

Patrick H. Zabel, Devine, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1986, Ser. No. 852,462
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—521 **9 Claims**



1. An elastic puller sabot for use in launching a flechette from a launcher having a bore, comprising:

at least two sabot portions;

said at-least-two sabot portions together forming said sabot, and together having an interior surface and an exterior surface;

said interior surface having a generally identical shape to that of an exterior of said flechette;

said exterior surface having a generally identical shape to that of an interior of said bore, said exterior surface further having a diameter no smaller than that of said interior of said bore;

each of said at-least-two sabot portions being comprised of an elastic material.

H297
ROBOTIC REFUELING SYSTEM FOR TACTICAL AND STRATEGIC AIRCRAFT

Edwin R. Schultz, Waynesville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 12, 1985, Ser. No. 764,820
Int. Cl.[4] B64D *37/16;* **B60P** *3/22*
U.S. Cl. 141—232 **2 Claims**

1. A fixed facility aircraft refueling apparatus, comprising:

(a) a covered structure sufficiently large whereby an aircraft may pass beneath it, the structure having a ceiling and a

aligned entrance and exit so that an aircraft may enter and exit along a substantially straight line of travel:

(b) an overhead track attached to the structure;

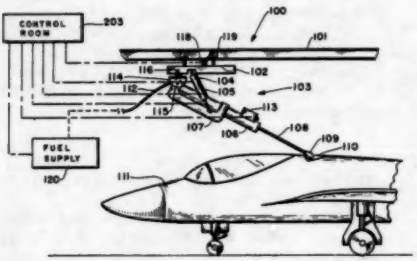
(c) a trolley suspended from the overhead track;

(d) means for moving the trolley along the overhead track;

(e) a telescoping boom having a first end and a second end, the boom pivotally connected at its first end to the trolley;

(f) a pair of telescoping piston-and-cylinder units connecting the boom and trolley controllably moving the boom in pitch and in yaw;

(g) an aircraft self-aligning refueling probe attached to the second end of the boom;



(h) a fuel supply;

(i) a fuel hose operatively interconnecting the fuel supply and the self-aligning refueling probe;

(j) a first video camera mounted on the boom;

(k) a lens with cross-hairs mounted to the first video camera;

(l) a second video camera mounted to the ceiling of the structure; and,

(m) a control room having means operatively interconnecting the control room with the trolley, the trolley moving means, the telescoping boom and the piston-and-cylinder units, the control room further having means for protecting its interior from environmental hazards.

H298
OXIDATION RESISTANT FILLER METALS FOR DIRECT BRAZING OF STRUCTURAL CERAMICS

Arthur J. Moorhead, Knoxville, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Division of Ser. No. 751,414, Jul. 3, 1985, Pat. No. 4,596,354. This application Mar. 11, 1986, Ser. No. 838,492

Int. Cl.[4] B23K *35/22, 31/02*

U.S. Cl. 228—263.19 **2 Claims**

1. A brazing filler metal for joining ceramics and metals to themselves and to one another consisting essentially of 23 to 25 atomic percent aluminum and the balance nickel.

H299
COVERT BEAM PROJECTOR

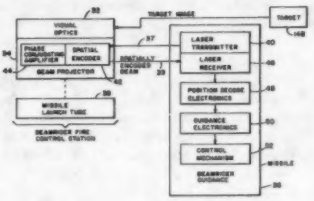
Walter E. Miller, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 15, 1986, Ser. No. 943,360

Int. Cl.[4] F41G *7/00*

U.S. Cl. 244—3.13 **5 Claims**

3. A beamrider missile guidance system comprising apparatus for transmitting a laser beam along a path from a missile toward a target tracking station during trajectory of the missile toward a target; a receiver on said missile for receiving laser energy from said tracking station; laser beam projecting means at said tracking station for receiving the transmitted laser beam, phase conjugating the received beam, encoding the



phase conjugated beam and redirecting the phase conjugated beam along said path back to the missile to said receiver.

H300
STRIPPING AGENT FOR CHEMICALLY RESISTANT COATINGS

Peter J. Hearst, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1986, Ser. No. 928,777

Int. Cl.[4] B08B *9/08;* **C11D** *1/66, 3/26;* **C23G** *5/02*

U.S. Cl. 134—22.19 **21 Claims**

1. A low viscosity stripping composition, suitable for application by spraying at elevated temperatures, for the removal of chemically resistant coatings, the mixture comprising:

(a) 79 percent by volume of N-methylpyrrolidone;

(b) 20 percent by volume of ethanolamine; and

(c) b 1 percent by volume of a non-ionic surface active agent for increasing penetration of the coating and without producing foam during spraying.

5. The method for removing chemically resistant coatings from walls of bilges and tanks, comprising:

(a) spraying the chemically resistant coatings within said bilges and tanks with a stripping composition comprised by volume of approximately 79 percent N-methylpyrrolidone, 20 percent ethanolamine, and 1 percent of a non-ionic surface active agent;

(b) said stripping composition being applied by spraying onto said chemically resistant coatings to be removed at a temperature range of 170 to 190 degrees F.;

(c) removing the used said stripping composition along with removed coating material for recycling of the stripping composition.

H301
OXIDATION RESISTANT FILLER METALS FOR DIRECT BRAZING OF STRUCTURAL CERAMICS

Arthur J. Moorhead, Knoxville, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Division of Ser. No. 751,414, Jul. 3, 1985, Pat. No. 4,596,354. This application Mar. 11, 1986, Ser. No. 838,489

Int. Cl.[4] B32B *15/04;* **B22F** *3/26;* **C03C** *27/02*

U.S. Cl. 428—627 **2 Claims**

1. A composite body comprising at least two structural components of ceramics and metals joined to themselves or to one another with a trinickel aluminide brazing filler metal disposed thereinbetween consisting essentially of 23 to 25 atomic percent aluminum and the balance nickel.

H302
CERAMICS CONTAINING DISPERSANTS FOR IMPROVED FRACTURE TOUGHNESS

Michael V. Nevitt; Anthony T. Aldred, both of Wheaton, and Sai-Kit Chan, Darien, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 1, 1985, Ser. No. 750,122

Int. Cl.[4] C04B *35/10, 35/04, 35/18, 35/50*

U.S. Cl. 501—103 **10 Claims**

1. A ceramic composition consisting essentially of a ceramic matrix of Al_2O_3, mullite, ZrO_2, MgO or mixtures thereof as a continuous phase with a hardness above about 800 and as a second component a tetragonal rare-earth niobate, tantalate or mixtures of these with each other and/or with a rare-earth vanadate, the second embodiment being present in an amount in the range of about 3–25 wt. % of the composition and dispersed in the matrix as particles sized below about 5 microns, the particles of the second component in the matrix having a transition temperature T_D being below the transition temperature for the second component in bulk or T_C.

H303
GLYCOSIDE-CONTAINING AGRICULTURAL TREATMENT COMPOSITION

Arshad H. Malik, Decatur, Ill., and Arno Cahn, Pearl River, N.Y., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Division of Ser. No. 739,241, May 30, 1985, now SIR H000224. This application Oct. 22, 1986, Ser. No. 921,706

Int. Cl.[4] A01N *57/00*

U.S. Cl. 514—85 **18 Claims**

1. A composition of matter comprising an active ingredient selected from the group consisting of insecticides and insect repellents and an effective amount of a glycoside dispersing agent selected from the group consisting of fructoside, glucoside, mannoside, galactoside, taloside, guloside, alloside, altroside, idoside, arabinoside, xyloside, lyxoside and riboside and mixtures thereof in a sufficient amount to form an emulsion or dispersion of the active ingredient, said glyoside dispersing agent corresponding to the formula:

$$R(OG)_x$$

wherein R contains from 1 to 30 carbon atoms; O is an oxygen atom; x has an average value of from 1 to about 18; and G is the glycosyl portion of said glycoside dispersing agent.

7. The composition of claim 1 wherein the glucoside dispersing agent is 2-ethylhexyl monoglucoside.

H304
PRINTING INK FOR USE ON FLEXIBLE FILMS

Robert J. Vorrier, Palos Hills, and Vitas Niaura, Western Springs, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 428,995, Sep. 30, 1982. This application Feb. 13, 1985, Ser. No. 701,233

Int. Cl.[4] C08F *2/50, 26/00*

U.S. Cl. 522—92 **46 Claims**

1. An ultraviolet light curable ink composition which comprises;

(i) a first urethane comprising a polyol urethane which is the reaction product of about one equivalent of an isocyanate containing intermediate, the isocyanate intermediate being the reaction product of about one equivalent of a monomeric diol and about two equivalents of an organic polyisocyanate, and about one equivalent oF a monomeric olefinically unsaturated compound containing exactly one active hydrogen, and

(ii) a second urethane comprising an acrylate-capped polycaprolactone which is the reaction product of a caprolactone polyol, a substituted or unsubstituted isocyanate, and an acrylyl compound, and defined by the formula;

$$(CH_2{=}\underset{\underset{Z}{|}}{C}COOROOCNH{-}G{-}NHCOO)_x{-}Q$$

where Z is hydrogen or methyl; Q is the residue of the caprolactone polyol, R is a linear or branched divalent alkylene having from 2 to about 5 carbon atoms; G is a linear or branched alkylene having from 1 to about 10 carbon atoms, or arylene, alkarylene and aralkylene having from 6 to about 12 carbon atoms, cycloalkylene having from 5 to about 10 carbon atoms, or bicycloalkylene having from 7 to about 15 carbon atoms; and x is an integer having a value from 1 to 4;

(iii) an ultraviolet photoinitiator in an amount sufficient to cure the ink composition when exposed to ultraviolet light, and

(iv) a pigment; wherein the first urethane and the second urethane are present in an amount such that the weight ratio of the first urethane to the second urethane is from about 2:5 to about 3:2.

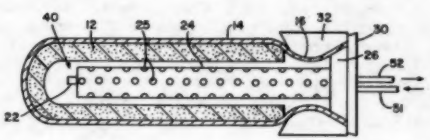
H305
DEMILITARIZATION OF HIGH BURN RATE PROPELLANTS CONTAINING FERROCENE OR ITS DERIVATIVES

Porter H. Mitchell, Fayetteville, Tenn., and William S. Melvin, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 6, 1986, Ser. No. 928,778

Int. Cl.[4] B01D *46/00*

U.S. Cl. 556—143 **4 Claims**



1. A method for extracting, removing, and recovering ferrocene or its derivatives from a solid propellant composition comprised of ammonium perchlorate, aluminum, crosslinked hydrocarbon binder, and said ferrocene or its derivatives, said method comprising:

i. introducing compressed carbon dioxide gas at a predetermined pressure and temperature which results in said compressed carbon dioxide being in a near critical liquid state into a pressure vessel containing cooled solid propellant composition having ferrocene or its derivatives as a dispersed ingredient that is extractible by said near critical liquid, said pressure vessel having an inlet means for introducing said near critical liquid and said pressure vessel having an outlet means having a plurality of perforations for discharging the near critical liquid and extractibles from said pressure vessel;

ii. providing an extraction time to achieve extraction of ferrocene or its derivatives from said propellant composition;

iii. providing an extended extraction time to achieve maximum extraction by circulating within said pressure vessel said near critical fluid containing ferrocene or its derivatives as extractibles;

iv. removing said near critical liquid containing said extractibles to a collection chamber;

v. effecting pressure change and temperature change of said near critical liquid containing said extractibles to achieve a phase change and subsequent evaporation of carbon dioxide to a gas to thereby achieve a separation of said extractibles;

vi recycling said carbon dioxide gas through a compressor for compressing to a compressed gas; and,

vii. recovering said extractibles which include ferrocene or its derivatives.

H306

METHOD FOR PREPARATION OF AMINE SALT BONDING AGENTS

Marjorie E. Ducote, and James G. Carver, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 9, 1986, Ser. No. 874,312
Int. Cl.[4] C07C *121/42, 121/453*
U.S. Cl. 558—452 **2 Claims**

1. A method for preparing an amine salt bonding agent comprising:

(i) adding a predetermined stoichiometric amount of a polyamine compound selected from a cyanoethyl substituted tetraethylene pentamine and the glycidol reaction product of cyanoethyl substituted tetraethylene pentamine to a reaction container;

(ii) slowly adding with stirring a predetermined amount of a stoichiometric amount of perchloric acid to said polyamine compound, and continue stirring to achieve a homogenious mixture;

(iii) transferring said homogenous mixture to a vessel appropriate for stripping diluent water; and,

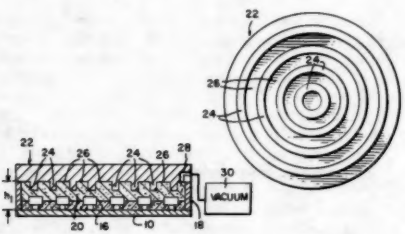
(iv) stripping diluent water from said reaction mixture and recovering said amine salt bonding agent.

H307

HIGH "G" ELECTRONICS SYSTEM

Stefan T. Epure, deceased, late of San Marino (by Gertrude M. Epure, executrix); Lee K. Clark, Santa Ana, and James P. Haine, Tustin, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 23, 1986, Ser. No. 877,945
Int. Cl.[4] H05K *5/06;* **B29C** *43/18;* **H05K** *1/14*
U.S. Cl. 174—52 PE **21 Claims**



1. For a potted circuit board having elements connected by leads, an assembly including:

a first walled means for surrounding the elements and connected to the circuit board;

an insulating means for insulating the elements, filling the first walled means;

a cap means for closing the first walled means, which when placed upon the first walled means extends slightly within the first walled means;

a venting means via which an excess of the insulating means travels with the cap closed;

a second walled means shorter than and for replacing the first walled means about the insulating means, and connected to the circuit board; and

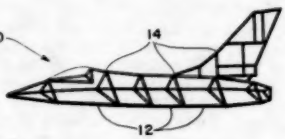
a pressing means for pressing the insulating means toward the circuit board until contacting the second walled means.

H308

FABRIC VISUAL/INFRARED/RADAR DECOYS

Michael B. Tutin, Thurston, United Kingdom; Steven A. Pitman, Beavercreek, and Gregory R. Bothe, West Carrollton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 28, 1986, Ser. No. 856,567
Int. Cl.[4] G01S *13/00*
U.S. Cl. 342—4 **12 Claims**



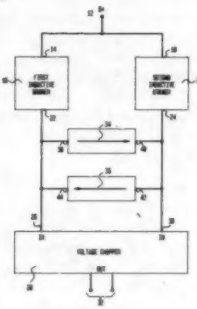
9. An aircraft decoy frame comprising tubing inserted into tubing fittings to form an assembly substantially defining the shape of an actual aircraft.

H309

ENERGY RECOVERABLE CHOKE FEED

Walter E. Milberger, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1986, Ser. No. 910,113
Int. Cl.[4] H02M *7/00, 7/538*
U.S. Cl. 363—124 **6 Claims**



1. An energy recoverable choke feed for a converter power supply having a voltage source and a voltage chopper circuit means for converting direct current voltage to alternating current voltage, comprising:

an input terminal connected to said voltage source;

first and second inductive branches, each having an input and an output, where said inputs of both of said inductive branches are connected to said input terminal;

first directional shunt means for passing current in a fixed direction connected between said outputs of said inductive branches;

second directional shunt means for passing current in a direction opposite to said first directional shunt means connected between said outputs of said inductive branches;

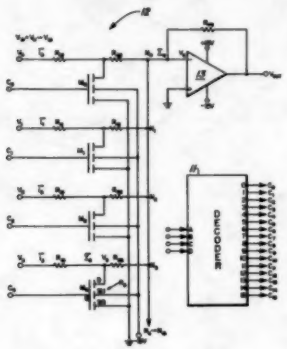
a first output terminal connected to said output of said first inductive branch; and

a second output terminal connected to said output of said second inductive branch, said first and second output terminals being connected to the first and second inputs, respectively, of said voltage chopper circuit means.

H310
ANALOG MULTIPLEXER

William V. Johnson, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 13, 1986, Ser. No. 880,621
Int. Cl.[4] H04J 3/02
U.S. Cl. 370—114 1 Claim



1. An analog multiplexer, comprising:

an op amp having an inverted and noninverting input and an output and further having a summing node coupled to said inverting input and a feedback resistor coupling said output to said inverting input;

at least two analog inputs each having a resistance coupling to said summing nodes;

an equal number of MOSFETs as said analog inputs, each said MOSFET having a drain, a source, a substrate, and a gate, said drain of each said MOSFET being connected to said resistance coupling, said source of each said MOSFET being only coupled to a common signal return, and said substrate of each said MOSFET being coupled to power source;

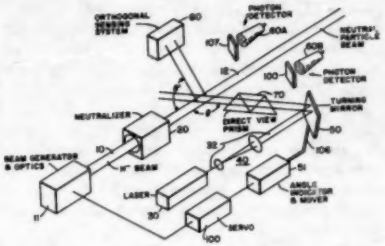
decoder-driving means having a plurality of digital inputs and a plurality of driver outputs, said driver outputs being equal in number to said MOSFETs, each said driver output being coupled to said gates of each said respective MOSFET, for receiving a digital command input, and for driving one said gate of each said MOSFET low and driving said gates of all other MOSFETs high.

H311
COMPENSATED LASER RESONANT FLUORESCENCE BEAM SENSING DEVICE FOR NEUTRAL PARTICLE BEAMS

Robert W. Jones; George R. Edlin; Brian R. Strickland, and Thomas G. Roberts, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 18, 1986, Ser. No. 943,239
Int. Cl.[4] H01S 3/10, 3/13
U.S. Cl. 372—9 5 Claims

1. In a system where first and second energy beams are intersecting at an angle at an intersection so as to cause resonant fluorescence in accordance to factors including the magnitude of said angle and the frequency of said first beam, the improvement comprising a direct view prism positioned between said first beam and the intersection of said beams for

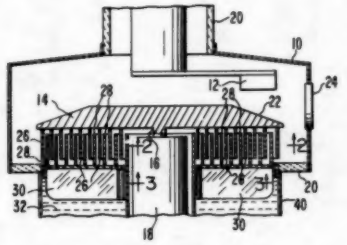


causing a compensating change in the magnitude of said angle in accordance to a change in the frequency of said first beam.

H312
ROTATING ANODE X-RAY TUBE

Todd S. Parker, 117 W. 1050 South, Bountiful, Utah 84010

Filed Feb. 1, 1985, Ser. No. 697,110
Int. Cl.[4] H01J 35/10
U.S. Cl. 378—127 29 Claims



1. An X-ray generating tube, comprising:

(a) a vacuum envelope;

(b) an anode, within said envelope, adapted for rotation about an axis and including a peripheral track and a first set of fins for radiating thermal energy;

(c) cathode means within said envelope, for generating a beam of electrons to strike said peripheral track with sufficient energy to generate X-rays;

(d) a window allowing transmission of said X-rays outside the tube; and

(e) a second set of fins, mounted on the inside of said vacuum envelope, and in thermal contact with the exterior of the tube, said second set of fins being interleaved with said first set of fins.

H313
MONOCHROMATOR FOR CONTINUOUS SPECTRUM X-RAY RADIATION

Jean-Louis Staudenmann, Ames, Iowa, and Gerald L. Liedl, West Lafayette, Ind., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 557,517, Dec. 2, 1983. This application Apr. 23, 1986, Ser. No. 854,708
Int. Cl.[4] G01N 23/20; G21K 1/06; G01J 1/00
U.S. Cl. 378—81 10 Claims

1. A monochromator for a continuous spectrum beam of photons comprising:

a first diffraction means;

a second diffraction means;

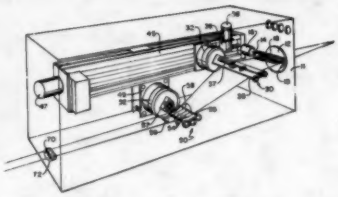
a means for positioning said first and second diffraction

means with respect to an incoming continuous spectrum beam of photons and with respect to each other in a plurality of sets of positions such that in each set of positions photons of a selected energy will be firstly diffracted by said first diffraction means and secondly diffracted by said second diffraction means to form a monochromated output beam generally parallel to said incoming beam and displaced therefrom by a fixed distance; said positioning means including:

a first means for rotating said first diffraction means about a first axis generally perpendicular to said incoming beam;

a second means for rotating said second diffraction means about a second axis, generally parallel to said first axis, said first and second rotating means being independent of each other;

a means for translationally moving said first diffraction means with respect to said second diffraction means along an axis coincident with said incoming beam of photons,



said translating means being independent of said first and second rotating means.

REISSUES

JULY 7, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

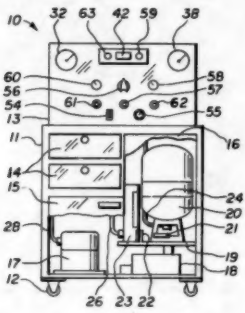
Re. 32,451
WEIGHT-MONITORED AIR-CONDITIONER CHARGING STATION

Robert H. Proctor, Baltimore, and Arthur G. Hobbs, Jr., Hampstead, both of Md., assignors to Murray Corporation, Cockeysville, Md.

Original No. 4,513,578, dated Apr. 30, 1985, Ser. No. 497,167, May 23, 1983. Application for reissue Nov. 26, 1985, Ser. No. 802,351

Int. Cl.[4] F25B *45/00*

U.S. Cl. 62—149 **30 Claims**



13. In an air-conditioner charging station, the combination of:

(a) a powered vacuum pump for evacuation of an air-conditioner;

(b) a reservoir of refrigerant under pressure,

(c) conduit means and electrically operated valve means for selectively connecting said pump and said reservoir to the air-conditioner to be serviced,

(d) weighing means for sensing the weight of said reservoir and for producing an output signal proportional to the weight of said reservoir,

(e) electronic sequencing means operatively associated with said valve means and said weighing means for receiving said output signal for monitoring weight loss from said reservoir as refrigerant is discharged therefrom and for generating signals for controlling said valve means,

(f) adjustable weight differential input means operatively connected to said sequencing means for introducing into said sequencing means a selected value representative of a preselected weight of refrigerant to be discharged from said reservoir,

(g) means for initiating operation of said sequencing means to receive and monitor said weighing means output signal and to provide signals to said control valve means for charging a preselected weight of refrigerant from said refrigerant reservoir into the air-conditioner,

(h) a digital visual display unit for said selected weight differential means,

(i) wherein said sequencing means senses the weight loss in said reservoir during said charging cycle and said display unit continuously indicates said weight loss, and

(j) wherein said sequencing means senses both the weight loss and the rate of weight loss in said reservoir, and

(k) signal means actuated in response to a separate predetermined parameter of rate of weight loss for said reservoir.

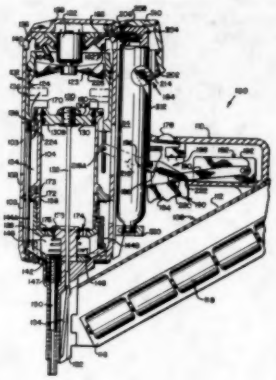
Re. 32,452
PORTABLE GAS-POWERED TOOL WITH LINEAR MOTOR

Milovan Nikolich, Wilmette, Ill., assignor to Signode Corporation, Glenview, Ill.

Original No. 4,483,280, dated Nov. 20, 1984, Ser. No. 550,521, Nov. 14, 1983. Continuation of Ser. No. 227,193, Jan. 22, 1981, abandoned. Application for reissue Feb. 20, 1986, Ser. No. 831,521

Int. Cl.[4] F02B *71/04*

U.S. Cl. 123—46 SC **21 Claims**



13. A self-starting portable tool comprising

a housing,

an elongated cylinder in said housing,

a piston having an upper face and a lower face, said piston being mounted in said cylinder to be driven between an upper position of rest and a lowermost position and forming a motor member,

a working member attached to said piston,

a combustion chamber formed within said housing and having the upper face of said piston defining a wall portion of said combustion chamber,

means for providing a fuel and air mixture in said chamber,

means for igniting and exploding said mixture in said combustion chamber to drive said piston through a driving stroke from said upper position to said lowermost position to operate said working member,

and return means for causing said piston to move upwardly from said lowermost position to said upper position of rest, said return means including outlet means in said elongated cylinder between its ends for communicating said cylinder with ambient atmosphere and being disposed below said upper position of rest and above said lowermost position of said piston, such that when said piston is driven towards said lowermost position, said piston moves past said outlet means thereby to place said combustion chamber in communication with said outlet means to exhaust a portion of combustion gases from said combustion chamber to ambient atmosphere and cause a reduction in temperature of the combustion gases remaining in the combustion chamber, and

said return means further including bumper means at the lower end of the cylinder for initially moving said piston upwardly from said lowermost position, said combustion chamber above said upper face being out of communication with ambient atmosphere during the further return of said piston to said

upper position of rest, said further return of said piston to said upper position of rest being substantially caused by throughout further such return, said return means producing an upwardly acting pressure differential on said upper and lower faces of said piston induced by the reduction in temperature of the combustion gases above the upper face to produce a sharp reduction of pressure in said combustion chamber to below ambient pressure.

Re. 32,453

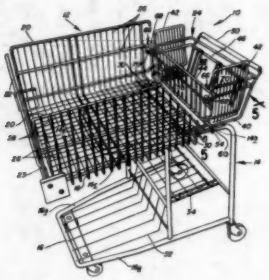
SHOPPING CART WITH BABY SEAT

Don A. Stover, Oklahoma City; Clarence W. Upshaw, Tuttle, and Warren N. Norman, Oklahoma City, all of Okla., assignors to UNR Industries, Inc., Chicago, Ill.

Original No. 4,423,882, dated Jan. 3, 1984, Ser. No. 376,593, May 10, 1982. Application for reissue Sep. 9, 1985, Ser. No. 773,561

Int. Cl.[4] B62B *3/00*

U.S. Cl. 280—33.99 B **22 Claims**



1. A shopping cart which comprises:

(a) a wheeled chassis;

(b) an elevated frame carried by said chassis;

(c) a basket defining a main lading-carrying space, said basket including a bottom wall secured to said elevated frame, two opposed side walls, and a gate at the front end of said cart, and having an open end at the rear thereof;

(d) a baby seat compartment secured to the rear portion of said elevated frame, said baby seat including a bottom wall, two opposed side walls, a front wall having an upright, closed position and an open position, the width of said baby seat front wall being less than the width of said lading-carrying basket [said hinge for said baby seat front wall being located at a level at least as high as the bottom walls of said lading-carrying basket,] said front wall being hinged at its bottom edge portion to permit it to be swung down from its closed position in the forward direction, when desired, to rest on the bottom wall of said lading-carrying basket, *said hinge for said baby seat front wall being located at a level at least as high as the bottom wall of said lading-carrying basket* and a rear wall defining two openings to receive the legs of a baby seated in said baby seat; and

(e) latching means for providing a positive holding of said baby seat front wall to secure the same against movement in either the forward or rearward direction from its said upright, closed position while a baby is seated in the seat, said means being releasable when it is desired to swing said front wall down to rest on the bottom wall of said basket to increase the lading-carrying capacity of the shopping cart.

Re. 32,454

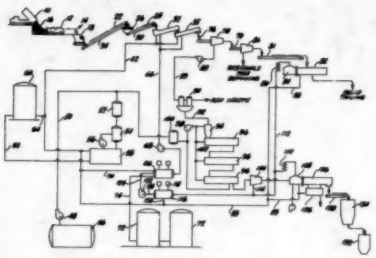
PROCESS FOR DESULFURIZATION OF COAL AND ORES

Arthur E. Starbuck, Sparks, Nev., assignor to Pure Fuel of Nevada, Inc. and Ag-Con Materials of Nevada, Inc., both of Reno, Nev.

Original No. 4,213,793, dated Jul. 22, 1980, Ser. No. 882,866, Mar. 2, 1978. Application for reissue May 26, 1981, Ser. No. 266,631

Int. Cl.[4] C09K *3/00;* **C01B** *17/08*

U.S. Cl. 106—286.8 **26 Claims**



1. A process for desulfurizing ores containing sulfur comprising the steps of:

a. crushing ore containing sulfur to a particle consistency;

b. feeding the crushed ore to a heated continuous-flow processor;

c. introducing pre-heated sulfur dissolving solvent into said processor with the crushed ore;

d. concurrently mixing and force conveying the crushed ore and solvent by augering in the continuous flow processor at an elevated temperature in which sulfur is dissolvable and is dissolved in a heated sulfur-solvent solution with suspended particles and a remaining ore, the processor being oriented for about horizontal augering;

e. separating the sulfur-solvent solution with suspended particles from the remaining ore at an elevated temperature;

f. drying the separated, remaining ore by evaporating remaining solvent from the ore;

g. recovering solvent from the ore drying step by condensing the evaporated solvent;

h. *in the same operative process step,* concurrently crystalizing sulfur dissolved in the sulfur-solvent solution and force conveying the sulfur-solvent solution and crystalizing sulfur by augering in a continuous flow chilled processor wherein the sulfur-solvent solution and crystalizing sulfur are conveyed together in a concurrent manner as a mixture in a continuous forward direction at controlled reduced temperatures as substantially the entire mixture progresses to a separate separating step, said crystalizing sulfur existing in part as a suspension and in part as a precipitate;

i. separating both crystalized suspension sulfur and crystalized precipitate sulfur from the solvent solution;

j. drying the separated crystalized sulfur by evaporating the solvent from the crystalized sulfur, wherein a fine crystal sulfur product is obtained;

k. recovering solvent from the crystalized sulfur drying step by condensing the evaporated solvent.

Re. 32,455

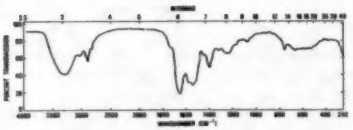
A-21978 ANTIBIOTICS AND PROCESS FOR THEIR PRODUCTION

Robert L. Hamill, Greenwood, and Marvin M. Hoehn, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

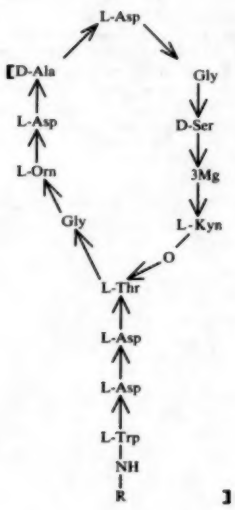
Original No. 4,331,594, dated May 25, 1982, Ser. No. 206,749, Nov. 14, 1980. Continuation-in-part of Ser. No. 41,274, May 21, 1979, abandoned, which is a division of Ser. No. 951,695, Oct. 16, 1978, Pat. No. 4,208,403. Application for reissue Sep. 26, 1985, Ser. No. 780,734

Int. Cl.[4] C07C *103/52*

U.S. Cl. 530—317 **18 Claims**



1. Antibiotic A-21978C factor C_0, which has the following structural formula:



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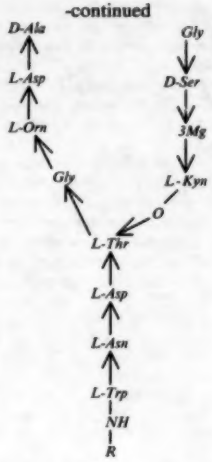


wherein 3MG represents L-threo-3-methylglutamic acid, and R is a C_{10}-alkanoyl moiety; and which has:

(a) a molecular formula of approximately [$C_{72}H_{100}N_{16}O_{27}$:] *$C_{72}H_{101}N_{17}O_{26}$*;

(b) a molecular weight of approximately [1622] *1621*; and which, in sodium salt form, has these characteristics;

(c) an approximate elemental composition of 52.07% carbon, 5.95% hydrogen, 12.73% nitrogen, 25.84% oxygen and 3.4% sodium;

(d) an infrared absorption spectrum in KBr pellet as shown in FIG. 5 of the drawings;

(e) upon hydrolysis yields the following amino acids: aspartic acid, glycine, alanine, serine, threonine, tryptophan, ornithine, kynurenine, and 3-methylglutamic acid;

(f) is soluble in methanol, ethanol, propanol, butanol, dimethylformamide, dimethyl sulfoxide, dioxane, tetrahydrofuran, and water and in acidic and alkaline solutions, except at pH levels of below about pH 3.5; but is only slightly soluble or is insoluble in acetone, chloroform, diethyl ether, benzene, ethyl acetate, and hydrocarbon solvents;

(g) an R_f value of approximately 0.71 on reversed-phase silica-gel TLC in water:methanol:acetonitrile (45:15:40) which contains 0.2% pyridine and 0.2% acetic acid; and

(h) the following specific rotation: $[\alpha]_D^{25}+11.9°$ (c 0.7, H_2O);

or a cationic or acid addition salt of A-21978 factor C_0.

Re. 32,456

BATTERY POWERED DRAWER OPENING DEVICE

Shiro Ishii, Garden Grove, Calif., assignor to M-S Corporation, Stanton, Calif.

Original No. 4,424,426, dated Jan. 3, 1984, Ser. No. 391,911, Jun. 24, 1982. Application for reissue Jan. 2, 1986, Ser. No. 815,819

Int. Cl.[4] H01H *3/16*

U.S. Cl. 200—61.61 **20 Claims**

1. An electrically opening drawer assembly comprising:

[a.] a casing;

[b.] a drawer tray slidable into and out of said casing;

[c.] a first latch member fixed to said drawer tray;

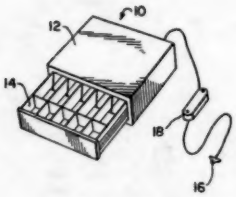
[d.] a second latch member pivotally mounted to said casing for rotation about a first mounting axis, having a hook portion engageable with said first latch member when said second latch member is in a first rotational position to hold said drawer tray inside said casing, said first latch member being spaced from said first mounting

axis in a first direction radially outwardly extended from said first mounting axis, said second latch member having a first extended portion radially extending from said first mounting axis;

[e.] a solenoid fixed in said casing, [and means, electrically capable of being coupled to said solenoid, for energizing said solenoid in response to] *energizable by* an applied [DC] voltage;

[f. switch means for coupling said energizing means to said solenoid to apply said DC voltage to said solenoid;

g.] a third latch member pivotally mounted to said casing for rotation about a second mounting axis, having a second extended portion extending generally radially outwardly from said second mounting axis and engageable at an end thereof spaced from said second mounting axis



with an end of said first extended portion spaced from said first mounting axis;

[h.] means, responsive to energization of said solenoid by said [DC] voltage, for rotating said second extended portion about said second mounting axis so as to disengage said first extended portion from said second extended portion;

[i.] first spring means, coupling said first and second extended portions, for biasing said first and second extended portions into engagement; and

[j.] second spring means for rotating said second latch member to disengage said hook portion from said first latch member and for urging said drawer tray out of said casing when said first latch member is disengaged from said hook portion.

Re. 32,457

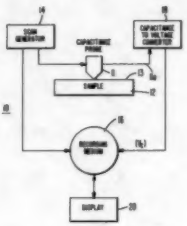
SCANNING CAPACITANCE MICROSCOPE

James R. Matey, West Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Original No. 4,481,616, dated Nov. 6, 1984, Ser. No. 307,021, Sep. 30, 1981. Application for reissue Dec. 19, 1985, Ser. No. 811,152

Int. Cl.[4] G11B *9/06*

U.S. Cl. 369—58 **6 Claims**



10. A method for determining variations in the electrical properties of the surface layer of a body of material comprising the steps of:

(a) scanning said surface layer with a capacitance probe to generate a first signal representing capacitance variations between said surface layer and said probe;

(b) scanning a recording medium in synchronism with the scanning of the surface layer with said probe;

(c) recording said first signal on the recording medium as a second signal;

(d) generating a first image from said second signal corresponding to a predetermined surface portion of said surface layer;

(d1) storing said first image in memory;

(e) coating said surface layer with a conformal metallic coating having a thickness in excess of the Thomas-Fermi shielding range for electrons in the material comprising the metal of said metallic coating, said coating being thin enough to prevent significant changes in the mechanical properties of said surface layer;

(f) after step (e) repeating steps (a) to (c) to generate a third signal representing capacitance variations and recording of said third signal as a fourth signal for generating a second image of said predetermined surface portion;

(g) generating said first image from memory; and

(h) comparing said first image to said second image to determine variations in electrical properties of said surface as manifested by the presence of features in the first image which are absent in the second image.

PATENTS

GRANTED JUL. 7, 1987

ERRATA

For CLASS	See PATENT NO.
072-015	4,678,042
439-610	4,678,121
439-077	4,678,249
439-083	4,678,250
439-061	4,678,251
439-062	4,678,252
439-210	4,678,253
439-139	4,678,254
439-267	4,678,255
439-347	4,678,256
439-426	4,678,257
439-571	4,678,258
439-610	4,678,259
439-607	4,678,260
439-532	4,678,261
439-857	4,678,262
356-301	4,678,277
029-407	4,678,924
439-633	4,678,932
380-015	4,679,078
315-399	4,679,211

PATENTS

GRANTED JULY 7, 1987

GENERAL AND MECHANICAL

4,677,694

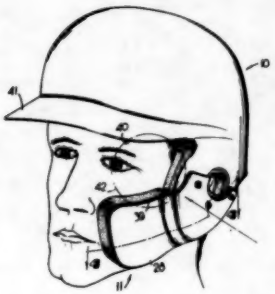
FACIAL PROTECTOR FOR BATTING HELMET

Robert W. Crow, 4400 Harris Valley Rd., Atlanta, Ga. 30327

Filed Jul. 16, 1986, Ser. No. 886,532

Int. Cl.[4] A41D *13/00*

U.S. Cl. 2—9 **6 Claims**



1. In a protective helmet of rigid, impact-resistant material adapted to be worn by batters and the like and having a domed shell configured to fit on the head of a player and a visor extending forwardly from said shell beyond the player's forehead. the improvement comprising a protective flap of rigid, impact-resistant material secured to and supported at one end by said shell adjacent to the ear of a wearer and cantilevered therefrom in spaced substantially parallel relation to the cheek and jaw on one side of the face of the player, said flap having a free end adjacent the chin of the player and having a lower edge approximately paralleling the lower line of the jaw of the player and an upper edge spaced below said visor to provide for unobstructed vision between said visor and said flap while cooperating with said visor to prevent a ball from penetrating between said visor and said flap.

4,677,695

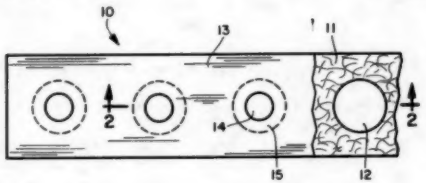
WEB WITH ADJUSTABLE OPENING AND METHOD OF MAKING THE SAME

Paul T. Van Gompel, Outagamie County, and Jody D. Suprise, Winnebago County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 6, 1986, Ser. No. 827,297

Int. Cl.[4] A41D *1/06;* **B32B** *3/10*

U.S. Cl. 2—79 **13 Claims**



1. A composite with an adjustable, conformable opening therein, comprising a base web of less extensible, lower elastic recovery material joined to a second web, of more extensible, higher elastic recovery material, wherein said base web has a first opening therein, and said second web has a second opening therein generally concentric with the first opening and of smaller size than said first opening, so that the second opening is circumferentially peripherally bounded by an annular-shaped segment of said second web, and said annular-shaped segment of said second web in turn is circumferentially peripherally bounded by said base web.

4,677,696

DUST-FREE GARMENT FOR CLEAN ROOM

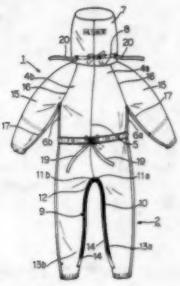
Norito Tanaka, Tokyo, Japan, assignor to Toyo Lint Free Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1986, Ser. No. 931,612

Claims priority, application Japan, Apr. 18, 1986, 61-57545[U]

Int. Cl.[4] A41D *10/00, 13/00*

U.S. Cl. 2—84 **6 Claims**



1. A dust-free garment for clean rooms, comprising:

a jacket portion having sleeves, a pants portion having legs and a crotch portion, and a hood portion which are sewn together and made from synthetic woven cloth having an anti-static property, said jacket portion and said pants portion each having a front part and a back part, the front part of said jacket portion and pants portion being formed with one single continuous piece of cloth without seams or facings therein;

an open-close portion provided along the insides of both legs and the crotch of the pants;

fastener means coupled to said open-close portion of the garment for selectively opening and closing said open-close portion;

seams between said jacket portion and said hood portion, between the front part and back parts of said jacket and pants portions, between front and back parts of said jacket portion and said sleeves, and between right and left back parts at the center of the back, being covered with piping of pieces of tape attached from the outside of the garment to keep airtightness;

a first drawstring provided at the waist of the garment along the center of a back portion of the garment; and

a second drawstring provided at a neck portion of the garment along the back side of said hood portion.

4,677,697

CLEAN UP GLOVE

Starr R. Hayes, 1312 Bergan Rd., Oreland, Pa. 19075

Filed Jan. 14, 1985, Ser. No. 691,607

Int. Cl.[4] A41D *19/00;* **B65D** *85/00, 30/10*

U.S. Cl. 2—159 **4 Claims**

1. A pair of disposable clean up gloves separably attached to one another, comprising:

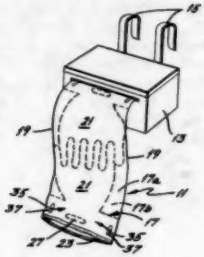
a pair of pliable film hand-shaped enclosures with finger shapes and open wrist ends, said finger shapes of each glove interlacing with those of the other glove, each said glove having a first and second edge;

means for fastening closed said open wrist ends of each said hand shaped enclosue, said fastening closed means being positioned on the normally outer side of each said hand shaped enclosure near said open wrist end;

said fastening closed means including a first closure member to join said wrist ends in a straight line seal, and a second closure member to draw said wrist ends together;

said first closure member including a male interlocking strip on one side of said wrist end and a female interlocking strip on the other side of said wrist end; and

said second closure member comprising a first tab extending



outwardly on the first edge of each said glove at said wrist end and a second tab extending outwardly on the second edge of each said glove at said wrist end, said first and second tabs being long enough to be tied together.

4,677,698

HOCKEY GLOVE HAVING A FLEXIBLE CUFF

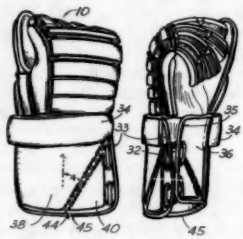
David J. Angas, Milton, Canada, assignor to Karhu Titan Canada Limitee, Canada

Filed Jun. 12, 1986, Ser. No. 873,412

Claims priority, application Canada, Jan. 22, 1986, 500094

Int. Cl.[4] A41D *13/08*

U.S. Cl. 2—161 A **9 Claims**



1. An improved hockey glove comprising:

a hand portion including a thumb encasing portion; and

a cuff portion having a lower edge and an upper edge spaced apart from each other so as to define a longitudinally extending opening distal from said thumb encasing portion of said hand portion;

wherein said cuff portion comprises a triangular-shaped segment having first, second and third sides, one of said upper and lower edges defining said first side, an end of said cuff portion distal from said hand portion defining said second side, and a hinge defining said third side, said hinge extending from a first point located on the end of said cuff portion at a certain distance from one end of said one of said upper and lower edges toward a second point located on said one of said upper and lower edges.

4,677,699

WAIST BAND ADJUSTMENT FOR GARMENT

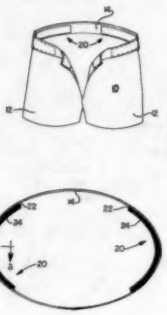
David J. Barabe, 2741 Lansdale La., Winston Salem, N.C. 27103

Filed Jul. 16, 1986, Ser. No. 886,569

Int. Cl.[4] A41D *1/14*

U.S. Cl. 2—221 **8 Claims**

1. In combination with an apparel garmet of the type having a waist band at the top thereof, a waist band adjustment means comprising at least one first flexible strip with a length of about one-half or less than the length of the garmet waist band secured internally to the waist band of said garment and having fastening means on at least a portion of the outer face thereof, and at least one second flexible strip for attachment to said first flexible strip and being substantially coextensive therewith,



said second flexible strip having fastening means on at least a portion of one face thereof for releaseably engaging the fastening means of said first strip, whereby said second strip may be removed and attached to said first strip according to increases and decreases, respectively, in the waist size of a person wearing the apparel garment.

4,677,700

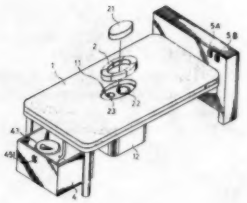
LAVATORY HOSPITAL BED

Cheng-Chung Su, No. 26, Shin Chong Road, Tainan, Taiwan

Filed Mar. 10, 1986, Ser. No. 837,787

Int. Cl.[4] A61G *7/02*

U.S. Cl. 5—90 **2 Claims**



1. An improved lavatory hospital bed system comprising the combination of:

a mattress with a recess and a removable cushioned insert fitting therein, diaper funnels adapted for the sex of the patient which have a fitting for a spray nozzle for cleaning the patient after usage of said diaper, fluid piping which leads to said spray nozzle, and further characterized in that:

said spray nozzle is activated for either water or air by on/off switches on said lavatory hospital bed;

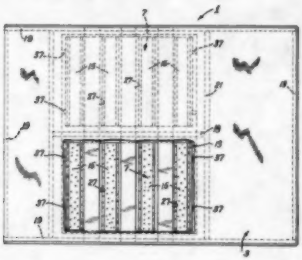
said diaper funnels having a scoop-like shape which does not directly contact the patient but which hangs down into the recess and which funnels wastes into a disposal pipe;

a disposal pipe, a urine disposal pipe, a neutralization tank containing sterilizing chemicals, an air dryer, a water pump, and piping which leads from a solenoid valve to a spray nozzle.

4,677,701
FIRMNESS CONTROL DEVICE

Michael H. Galumbeck, 5577 Vantage Point Rd., Columbia, Md. 21044

Filed Nov. 19, 1985, Ser. No. 799,647
Int. Cl.[4] A47C 23/04, 27/04
U.S. Cl. 5—447 9 Claims



1. A variable firmness control device for a foundation defined in part by an upper support surface and an internal support structure for providing resiliency to the upper support surface, which device comprises:

(a) a platform for attachment to the underside of the foundation below the internal support structure;

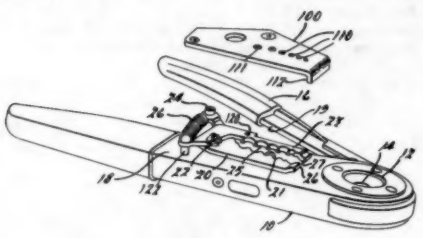
(b) a plurality of spaced resilient members carried by the platform;

(c) means for moving the platform for simultaneously positioning the resilient members between portions of the internal support structure and at a desired distance from the upper support surface whereby the degree of deflection of the upper support surface is determined by the position of the resilient members independent of the internal support structure.

4,677,702
WIRE INSULATION STRIPPER GUIDE

Thomas M. Cairns, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 17, 1986, Ser. No. 819,784
Int. Cl.[4] H02G 1/12
U.S. Cl. 7—107 2 Claims



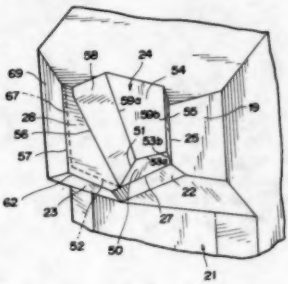
1. In combination with a wire terminal crimping tool having a pair of separate and pivotable handles and an insulation cutter mounted at a predetermined height above one of said handles with one fixed die and one movable die pivotable with respect to said fixed die to precisely cut the insulation portion of an insulated wire inserted therein at a distance from the end of said wire that does not exceed said predetermined heighth distance, an improvement comprising:

plate means fixedly mounted above said fixed die of said insulation cutter and defining at least one aperture corresponding to the diameter of the insulated wire insertable for cutting by said insulation cutter and aligned in an axial direction therewith to restrict removal of said wire from said insulation cutter to said axial direction.

4,677,703
DIES FOR FORMING DRILLING SCREWS

Katsuhisa Yamasaki, Hatano, Japan, assignor to Topura Co., Ltd., Osaka, Japan

Continuation of Ser. No. 667,055, Oct. 31, 1984, Pat. No. 4,586,862, which is a continuation of Ser. No. 337,278, Jan. 5, 1982, abandoned. This application Mar. 7, 1986, Ser. No. 837,295
Claims priority, application Japan, Jan. 12, 1981, 56-2830
Int. Cl.[4] B21K 1/44; B23G 9/00
U.S. Cl. 10—9 5 Claims



1. Dies for manufacturing a drill section of a drilling screw utilizing a pair of dies, each die comprising:

a block member having a top, a bottom and sides;

a cavity adjacent to one side of the block and having openings in the top and said one side of said block, said cavity comprising a flat inclined tapering bottom, a first flat inclined tapering inside wall, a second flat inclined inside wall, and a third flat inclined front inner wall;

a first top flat elongate face provided adjacent to an upper edge of the first inclined tapering inside wall;

a first longitudinal straight side edge adjacent to said second flat inclined inside wall;

a second longitudinal straight side edge adjacent to said first top flat elongate face and parallel to said first side edge;

a first straight oblique inclined front edge adjacent to said third inclined front inner wall;

a second straight oblique inclined front edge adjacent to said first top flat elongate face and said second side edge and joining with said first front oblique edge at a front point;

two side inclined faces being respectively adjacent to said first and second parallel side edges;

two front inclined faces respectively adjacent to said first and second front oblique edges; and

a second top flat face adjacent to a concavity formed by said two front inclined faces and an adjacent face and lying in the same plane as said first top flat elongate face, said two longitudinal side edges and said two front oblique edges.

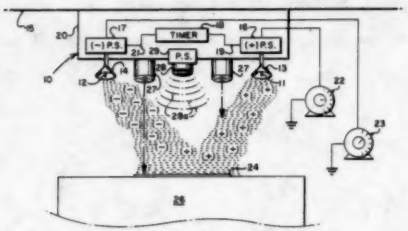
4,677,704
CLEANING SYSTEM FOR STATIC CHARGED SEMICONDUCTOR WAFER SURFACE

Richard A. Huggins, 19866 Beekman Pl., Cupertino, Calif. 95014

Filed Apr. 22, 1986, Ser. No. 854,481
Int. Cl.[4] A47L 5/14
U.S. Cl. 15—1.5 R 6 Claims

1. In a system for cleaning specks of contaminants from a static charged surface comprising means directing a stream of gas against the surface to blow the specks away, portions of said stream tending to provide a laminar flow of gas passing in protective spaced relation across said specks, means generating waves of positive and negative ions to flow toward said surface to charge said surface alternately positively or negatively to provide a substantially neutral charge thereto substantially

during the transition between said positive and negative charges when said static charge acting on said specks is substantially at a minimum so as to tend to release the specks from the surface into said flow of gas, and means for disturbing said laminar flow to permit said specks to be entrained in and blown



away from the surface by said stream of gas, the last-named means including means generating air-borne vibrations directed to flow toward the surface to disturb said laminar flow and specks during existence of said substantially minimum charge on said surface.

4,677,705

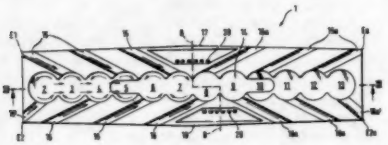
EXHAUSTER NOZZLE

Wilhelm Schuster, Frankfurt am Main, Fed. Rep. of Germany, assignor to Allstar Verbrauchsguter GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 17, 1986, Ser. No. 839,972

Int. Cl.[4] A47L *9/06*

U.S. Cl. 15—398 **7 Claims**



1. An exhauster nozzle for use in cleaning surfaces, said nozzle comprising:

an element enclosing a suction chamber and provided with a connecting suction pipe;

said element closed on the open side by an adapter plate;

said adaptor plate provided with a plurality of abutting and mutually merging substantially circular chambers, said chambers opening on the outside of said adaptor plate and at least one chamber being open to said suction chamber, said chambers situated essentially along the longitudinal axis of said adaptor plate;

air supply ducts situated on both longitudinal edges of said adaptor plate;

at least one air supply duct obliquely oriented in the direction of said suction chamber leading tangentially into each chamber from said longitudinal edges of said adaptor plate; and

said air supply ducts arranged on said longitudinal edges opening alternately into succeeding chambers.

4,677,706

CASTOR BRAKE

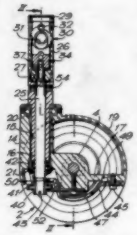
Stafford T. Screen, Stourbridge, United Kingdom, assignor to Colson Castors (Europe) Limited, United Kingdom

Filed Jun. 19, 1985, Ser. No. 747,076

Claims priority, application United Kingdom, Jun. 21, 1984, 8415846

Int. Cl.[4] B60B *33/00*

U.S. Cl. 16—35 R **18 Claims**



1. A castor comprising:

a body,

wheel means,

means rotatably mounting said wheel means on said body,

an elongate hollow mounting member,

means mounting said body on said mounting member for rotation about a substantially vertical axis spaced from said wheel rotatable means, and

brake means for braking said wheel means against rotation, said brake means comprising:

a brake member slidably guided in said hollow mounting member for movement downwardly along said substantially vertical axis to release said braking, and

brake member operating means carried by said mounting member and selectively operable to act on said brake member at the region of the upper end thereof to effect said movements of said brake member.

4,677,707

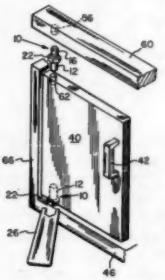
ADJUSTABLE UNITARY HINGE

James M. Holler, Jamestown, N.Y., assignor to Bush Industries, Inc., Jamestown, N.Y.

Continuation of Ser. No. 659,325, Oct. 10, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 884,495

Int. Cl.[4] E05D *5/10*

U.S. Cl. 16—239 **2 Claims**



1. In a furniture cabinet having opposed upper and lower frame members and opposed side frame members forming a frame opening for receiving a door and the door having opposed edges within said frame opening and said opposed edges of said door being spaced from said frame members to permit

movement of said door relative to said frame members, each of two opposed frame members being formed with an elongated hole with a longitudinal central axis in substantial alignment with the longitudinal central axis of the opposed hole, two opposed edges of said door being formed with an elongated hole having a longitudinal central axis in substantial alignment with the longitudinal central axis of the hole in the opposed edge of said door, the central longitudinal axes of the holes in said frame members and the central longitudinal axes of the holes in the opposed edges of said door being in substantial alignment when said door is positioned within said frame opening, the improvement comprising a rotatable one piece hinge pivotally connecting said door to the two opposed frame members, said rotatable one piece hinge having:

(a) a first substantially cylindrical solid shaft having a central longitudinal axis and an uninterrupted outer surface and adapted to fit into the elongated hole in the opposed edge of said door;

(b) a second substantially cylindrical solid shaft having a central longitudinal axis and adapted to fit into the elongated hole in the frame member;

(c) a plurality of rigid circumferential ribs on the exterior surface of said second shaft to create a friction fit between said second shaft and said elongated hole in said frame member;

(d) a solid intermediate portion located between said first shaft and said second shaft and integral with one end of each of said shafts and the exterior edge of said intermediate portion having an exterior edge parallel to the central longitudinal axes of said shafts and said exterior edge extending at all points around its circumference outwardly beyond the exterior cylindrical surface of said first shaft and the exterior cylindrical surface of said second shaft;

(e) said intermediate portion being located between the frame member and the edge of said door and said exterior edge of said intermediate portion being formed with a plurality of flats for access by a wrench at all points around the periphery of said exterior edge to rotate said intermediate portion and said shafts to adjust the lateral position of said one piece hinge;

(f) the central longitudinal axis of said intermediate portion being aligned with the central longitudinal axis of said second shaft and the central longitudinal axis of said first shaft being laterally offset from the central longitudinal axes of said intermediate portion and said second shaft; and

(g) a visual locater mark on a surface of said intermediate portion to position said one piece hinge relative to said frame members and a juxtaposed edge of the door located within said frame opening formed by said frame members;

(h) whereby rotation of said intermediate portion of said one piece hinge by the wrench rotates said first and second shafts about their respective central longitudinal axes to laterally adjust the position of said door relative to said frame members.

4,677,708

REPLACEMENT SPRING FOR A CORVETTE DOOR HINGE

James T. Streett, Pottstown, Pa., assignor to Street Specialty Products Inc., Pottstown, Pa.

Division of Ser. No. 490,433, May 2, 1983, Pat. No. 4,617,712.
This application Jan. 31, 1986, Ser. No. 824,520
Int. Cl.[4] E05D *11/10*
U.S. Cl. 16—334 **7 Claims**

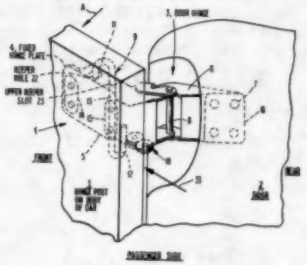
2. For a Corvette motor car, a cam follower spring to be mounted on the fixed hinge plate on the body of the car and engaged by cam means on the door of the car to establish a plurality of detents which control opening and closing of the door, the fixed hinge plate having a rear keeper slot and a keeper hole, the spring comprising:

a wire-form made of spring steel arranged in generally planar, S-shaped form and including:

a straight, elongated body;

an upper bent section on one end of the body;

on said upper bent section, a keeper slot whose locus is normal to the plane of the wire-form for use in receiving the forward edge of said keeper hole on said fixed hinge plate; and



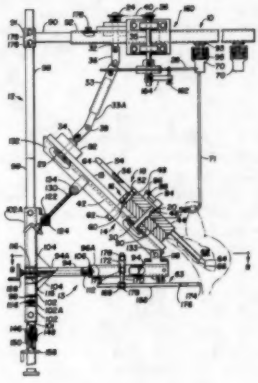
a lower bent section on the other end of the body to be engaged by said cam means whereby to create a plurality of detents for controlling opening and closing of the door and the lower bent section having a tip to extend into said rear keeper slot and be retained by one end thereof and to move toward and away from the rear keeper slot end when the lower bent section is engaged by said cam means.

4,677,709

POULTRY DELUNGER APPARATUS

Fred W. Dixon, R.F.D. 5, Bluff City, Tenn. 37618

Filed Jan. 23, 1986, Ser. No. 821,896
Int. Cl.[4] A22C *21/06*
U.S. Cl. 17—11 **10 Claims**



1. Poultry delunging apparatus comprising support means, manifold means stationarily affixed to said support means and having an upper bearing surface, a vacuum source adapted for connection to said manifold means, a delunging unit rotatably mounted on either or both of said manifold means or said support means and having a surface lying adjacent said bearing surface of said manifold means for sliding contact therewith, a plurality of vacuum probes on the periphery of said unit in prearranged spacing therearound and extending generally

radially outwardly therefrom, cooperating conduit means in said unit and said manifold means, valve means in said conduit means for rapidly opening or closing the same to apply or to interrupt the vacuum to said probes in a predetermined manner, said valve means comprising said bearing surface of said manifold means and said surface of said delunging unit, and drive means for rotating said unit at a prescribed speed.

4,677,710

ARRANGEMENT FOR CLEANING THE PRESSING ROLLERS OF A COMBING MACHINE

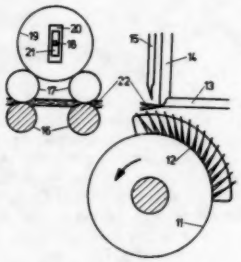
Hansulrich Eichenberger, Winterthur; Ludwig Lacher, Wetzikon, and Titus Schmid, Winterthur, all of Switzerland, assignors to Maschinenfabrik Rieter A.G., Winterthur, Switzerland

Filed May 7, 1985, Ser. No. 731,482

Claims priority, application Switzerland, May 7, 1984, 2219/84

Int. Cl.[4] D01C *19/22*

U.S. Cl. 19—218 **11 Claims**



1. An arrangement for use in a combing machine for cleaning a pressing roller that is pressed toward an associated detaching roller, comprising a cleaning roller; and means for mounting said cleaning roller for free rotation in engagement with the pressing roller about an axis parallel to that of the latter, the surface quality of said cleaning roller and the pressing roller being such that, during the operation of the combing machine, slippage occurs between said cleaning roller and the pressing roller, said cleaning roller having a smooth outer surface adverse to adhesion of fibers thereto, so that fibers do not adhere to said outer surface of said cleaning roller and cleaning of the latter is not necessary.

4,677,711

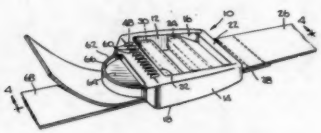
REVERSIBLE BUCKLE

Joseph Anscher, Huntington Bay, N.Y., assignor to National Molding Corporation, Farmingdale, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,281

Int. Cl.[4] A44B *11/04*

U.S. Cl. 24—200 **20 Claims**



1. A reversible fastener comprising:

a body having two side members that define an upper face and lower face;

means for securing the fastener to a workpiece; and

means for adjustably securing a strap to the fastener, said adjustably securing means comprising first and second substantially parallel cross-members disposed between and connecting common surfaces of said side members, said first and second cross-members being stationary within the body;

said first cross-member having a substantially convex region and said second cross-member having a substantially concave region disposed substantially opposite said convex region so that said regions are capable of cooperatively engaging and adjustably securing a strap threaded therethrough from said lower face or from said upper face.

4,677,712

HOSE CLAMP WITH TIGHTENER

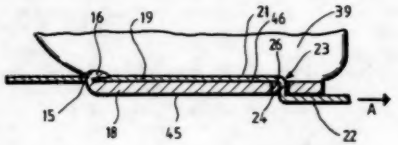
Kurt Allert, Oberndorf am Neckar, Fed. Rep. of Germany, assignor to Kurt Allert GmbH & Co. KG, Oberndorf am Neckar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 679,361, Dec. 7, 1984, abandoned. This application Sep. 18, 1985, Ser. No. 777,842

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 8419624[U]

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—274 R **16 Claims**



1. A hose clamp comprising:

a metallic tightening strap;

a tightener means including a housing having a bottom portion to which a terminal portion of the tightening strap is fastened, and a rotatably mounted tightening worm gear means cooperable with a gear tooth system of the tightening strap for enabling an adjustment of the tightening strap;

a bent part provided in a terminal portion of the tightening strap for enabling a fastening of the tightening strap to the bottom of the housing in a tension-proof manner;

a transverse slit including a pair of longitudinal walls provided in a bottom portion of the housing extending substantially at a right angle to the tightening strap for accommodating the bent part, said transverse slit having a width slightly larger than a thickness of the tightening strap;

wherein the bent part forms a cross bar adapted to be pressed onto one longitudinal wall of the transverse slit by a tension applied to the tightening strap, the bent part is formed by two approximately rectangular bends spaced from each other at a distance corresponding approximately to a height of the transverse slit; and

wherein said longitudinal walls of the transverse slit extend substantially at a right angle to the tightening strap, said longitudinal walls having the same height and being arranged at the same level, so that said longitudinal walls are not staggered heightwise with respect to each other.

4,677,713

ORONASAL MASK ASSEMBLIES

Warren K. Copp, Fleet, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 25, 1986, Ser. No. 843,605

Claims priority, application United Kingdom, Mar. 26, 1985, 8507796

Int. Cl.[4] A42B *7/00*

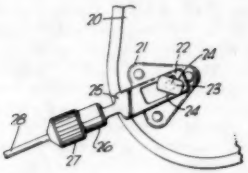
U.S. Cl. 24—590 **4 Claims**

1. A retaining means for an oronasal mask assembly for use

in conjunction with a protective helmet to facilitate quick release of the assembly from the helmet, the retaining means comprising:

a first part comprising (i) a base plate adapted to be mounted on the outside of the helmet, and (ii) a pillar extending outwardly from said base plate and having an enlarged, domed elongate head having parallel long sides and rounded apexes; and

a second part including (i) a cable length adjuster, (ii) a retaining cable for connecting said mask assembly to one end of said adjuster, and (iii) a slotted plate which is flexibly connected to the other end of said adjuster and is



adapted to pass over said domed head and to be retained by said pillar when the slot is aligned with the parallel sides of the head;

the first part being adapted to be so positioned on the helmet that when the mask assembly is retained on the helmet in its normal position, the slot makes an angle with the parallel sides of the head which is sufficient to prevent inadvertent separation of the first part and the second part of the retaining means during movement encountered in normal use but is not too great to prevent the first part and the second part of the retaining means from being separated manually.

4,677,714

QUICK-RELEASE FASTENER

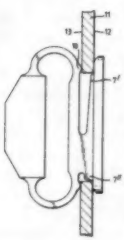
Andrew C. W. Wright, Surrey, England, assignor to Dzus Fastener Co. Inc., West Islip, N.Y.

Filed Jun. 20, 1986, Ser. No. 876,718

Claims priority, application United Kingdom, Jul. 11, 1985, 8517548

Int. Cl.[4] F16B *21/00*

U.S. Cl. 24—590 **3 Claims**



1. A one-piece receptacle for a quick-release fastener provided with a stud, for mounting in an aperture on a support, said receptacle having:

a central axis;

a base portion;

a stud-retaining structure having a coupling socket for engagement with corresponding parts of a stud of said fastener;

a pair of resilient webs substantially C-shaped in cross-section and connecting said stud-retaining structure to said base portion, said C-shaped resilient webs extending outwardly from opposite ends of said base to connect with opposite ends of said socket;

said base portion having a pair of thin walled portions defining a cross-cut elongate slot in a plane transverse to said central axis of the receptacle; and,

said C-shaped webs being integrally connected to said base portion in extension of the one of said thin walled portions closer to said stud-retaining structure, and said slot extending from one side of the receptacle across said central axis thereof, whereby said opposing thin walled portions of said base on opposite sides of said cross-cut slot can engage opposite surfaces of said support adjacent said aperture in which said receptacle is mounted.

4,677,715

BUCKLE, ESPECIALLY FOR A SAFETY BELT

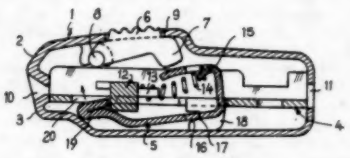
Gerard Escaravage, Valentigney, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Jul. 14, 1986, Ser. No. 884,947

Claims priority, application France, Jul. 17, 1985, 85-10965

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—637 **15 Claims**



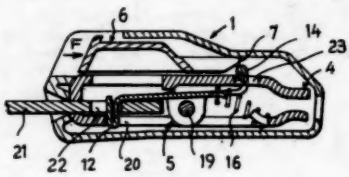
1. Buckle, particularly for a safety belt for an automobile vehicle, which is intended to attach in a removable manner a length of the belt to a fixed point of the vehicle body, comprising a catch assembly and a bolt (**21**) forming an integral part of the length to be attached, the catch assembly comprising, housed in a casing (**1**), a body (**4**) intended to be attached to a means of restraint forming an integral part of the vehicle and which defines a passage and a plane of sliding for the bolt, a member for locking (**5**) the bolt comprising an operating portion (**19**) which engages in a cavity (**22**) in the bolt (**21**) in the position in which the latter is locked, and articulated to the body (**4**) so as to be capable of swinging around an articulated pivot (**16**) which is approximately parallel to the plane of sliding and perpendicular to the direction of travel of the bolt, between a position in which the bolt is locked and a position in which it is unlocked, a sliding block (**12**) mounted in said body (**4**) so as to be capable of traveling along the direction of travel of the bolt (**21**) and which cooperates, on the one hand, with a front face of the bolt and, on the other hand, with resilient means for ejecting the bolt, means pushing the locking member towards its position in which the bolt is locked and means for producing unlocking (**6**) for moving the locking member (**5**) towards its position in which the bolt is unlocked, wherein the resilient means for ejecting the bolt and the means pushing the locking member towards its position in which the bolt is locked, consist of a spring (**14**) inserted between the sliding block (**12**) and the locking member (**5**); wherein said sliding block (**12**) is mounted so as to be capable of traveling in the body (**4**) between a forward position, in which a first bearing surface of the locking member is bearing against the sliding block (**12**), corresponding to the position in which the bolt is unlocked, and a rear position in which the locking member has oscillated relative to said body, so that a second bearing surface of the locking member is bearing against the sliding block, corresponding to the position in which the bolt is locked.

4,677,716

BUCKLE IN PARTICULAR FOR A SAFETY BELT

Jean Monsigny, Saverne, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Jun. 2, 1986, Ser. No. 869,787
Claims priority, application France, Jun. 10, 1985, 85 08755
Int. Cl.[4] A44B 11/25
U.S. Cl. 24—641 11 Claims



1. Buckle in particular for the safety belt of a motor vehicle, which buckle is intended to fix in a removable manner one end of the belt to a fixed point of the vehicle body by means of a latch (21) forming a lock integral with the end to be fixed, said buckle having a housing (1;1*a*) inside which there is located a body (4;4*a*;40) intended to be fixed to a retaining means integral with the vehicle and which defines a rectilinear passage for receiving the latch (21) and, in addition, a locking member (5;5*a*;30) intended to keep the latch in a locked position and a member (6) for releasing the latch, wherein the locking member (5;5*a*; 30) is mounted inside the body (4;4*a*;40) so as to oscillate and be slidably displaceable, in a direction parallel to the direction of displacement of the latch in the body, between a position where the latch is locked and a position where the latter is released and wherein said locking member has at its ends means intended to cooperate with stopping surfaces of the body (4;4*a*;40) and of the latch (21) via the action of a destabilizing device (16), and wherein said means consist of projections (12,14;12*i*,14*a*;31,32) and wherein the locking member has, in its central part, bearing means (18;18*a*;35) for the end of the latch (21) so that the latter is able to displace slidably the locking member (5;5*a*;30) inside the body towards the locked position, against the action of an elastic destabilizing device (16), said locking member (5;5*a*;30) having at one end of a first projection (12;12*a*;31) cooperating in the locked position, via the action of the destabilizing device, with a recess (22) in the latch (21) and with a stopping edge of an aperture (20;41) provided in a first wall of the body (4;40) and at its other end a second projection (14;14*a*;32) cooperating with an edge (23) of a second wall of the body (4;40) opposite the first wall, the end of said second projection (14;14*a*;32) protruding, in the locked position, beyond the second wall and being actuatable by the lock release member (6).

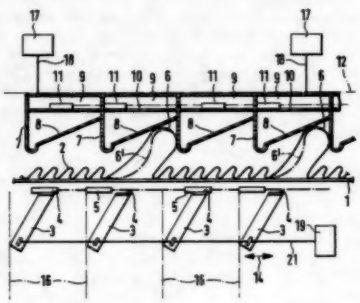
4,677,717

DEVICE FOR CONTINUOUS AND TENSION-FREE TREATMENT OF TEXTILE

Berthold Magin, Hassloch, Fed. Rep. of Germany, assignor to MTM Obermaier GmbH & Co. KG, Hassloch, Fed. Rep. of Germany

Filed Oct. 5, 1984, Ser. No. 658,224
Claims priority, application European Pat. Off., Oct. 8, 1983, 83110082.1
Int. Cl.[4] D06L 7/02
U.S. Cl. 26—18.5 9 Claims

1. Device for the continuous and tension-free treatment, such as drying, shrinking, finishing and the like, of textile fabric sheets, comprising a generally horizontally arranged transport belt having an elongated direction and a width direction extending transversely of the elongated direction for transporting an elongated fabric sheet in the transport direction corresponding to the elongated direction of said belt with the width of the fabric sheet supported on said belt in the width dimension, said transport belt having an upper side on which the fabric sheet is supported and an opposite lower side and a pair of opposite side edges spaced apart in the width direction and extending in the elongated direction, at least one lower nozzle located below the lower side of said transport belt and extending across in the width direction of said transport belt and arranged to direct air against the transpot belt so that the air passes through said belt into contact with the fabric sheet supported thereon, said at least one lower nozzle having a nozzle opening directed generally upwardly toward and extending across in the width direction of said transport belt, said at least one lower nozzle extends generally upwardly and is inclined in the transport direction relative to the vertical by a slight angle, a closing member associated with said at least one lower nozzle for selectively opening and closing said nozzle opening, generally vertically extending separating walls located above the upper side of said transport belt and extending across the width of said transport belt transversely of the transport direction, said separating walls being spaced apart in the transport direction and an adjacent pair of said separating walls defining a treatment zone extending therebetween in the elongated direction and in the width direction of said transport belt and with said at least one lower nozzle located aligned below said treatment zone, a perforated plate located above said transport belt and extending between a pair of adjacent said separating walls forming the treatment zone therebe-



tween, said perforated plate extending in the width direction and in the elongated direction of said transport belt from adjacent the lower end of the upstream one of said pair of separating walls to the downwstream one of said pair of separating walls whereby said perforated plate is inclined upwardly in the transport direction with the maximum vertical spacing between the upper side of said transport belt and said perforated plate being in the range of 5 to 15 cm, and said at least one lower nozzle has a vertical axis located between and spaced from the side edges of said transport belt and said lower nozzle is pivotable generally horizontally about the vertical axis so that said lower nozzle can be selectively oriented obliquely or perpendicularly to the transport direction whereby said lower nozzle can direct air upwardly through said transport belt for lifting the fabric upwardly toward said perforated plate from said transport belt with the fabric being lifted obliquely or perpendicularly in accordance with the selective orientation of said lower nozzle about the vertical axis, said pair of separating walls and said perforated plate form a baffle arrangement, said baffle arrangement having a generally horizontally arranged tilting axis extending in the transport direction and spaced inwardly from the side edges of said transport belt so that said baffle arrangement can be tilted about said tilting axis for varying the vertical spacing across the width of said baffle arrangement above said transport belt to compensate for any influences tending to stretch the fabric sheet.

4,677,718
SAFETY HOOD FOR PALETTE CHANGE-OVER DEVICES OF MACHINE TOOLS

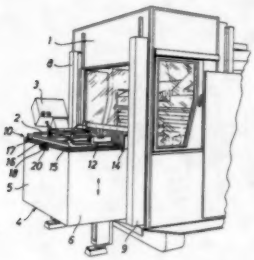
Werner Babel, Pfronten-Meilingen, Fed. Rep. of Germany, assignor to MAHO Werkzeugmaschinenbau Babel & Co., Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,430

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 8437044

Int. Cl.[4] F16P *3/04*

U.S. Cl. 29—33 P **2 Claims**



1. A safety hood for palette change-over devices of numerically controlled machine tools, comprising

A. a U-shaped hood which, in its operating position, surrounds the palette change-over device,

B. a driving mechanism for moving the hood,

C. guides for the hood, which guides are mounted on a fixed part of the machine, and

D. a probe, disposed in association with the hood, with an emergency circuit breaker which shuts down at least the driving mechanism of the safey hood as soon as the hood encounters a foreign body, said probe including a slightly protruding stirrup pivotably linked to the upper edge of the vertically moveable hood, which stirrup, on contact with the foreign body, pivots vertically against spring resistance and operates the emergency circuit breaker.

4,677,719
TOOL HOLDING DEVICE FOR LATHES

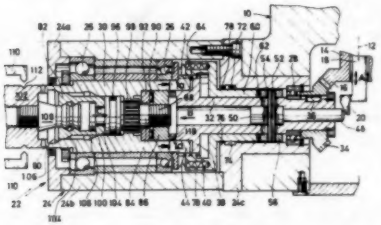
Helmut F. Link, Aichwald, Fed. Rep. of Germany, assignor to Index-Werke Komm.-Ges. Hahn & Tessky, Fed. Rep. of Germany

Filed Feb. 20, 1986, Ser. No. 831,354

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509635

Int. Cl.[4] B23B *3/22;* **B23C** *5/26*

U.S. Cl. 29—40 **9 Claims**



1. A tool carrier, in particular a tool turret, comprising a housing (**10**), a tool spindle (**30**) in the form of a hollow shaft, means mounting the tool spindle within said housing for rotation about a spindle axis, tool driver means carried by the tool spindle for rotating a tool (**102, 108**) about the spindle axis, a first threaded element (**86**), arranged in said tool spindle coaxially thereto, said first threaded element being rotatable relative to said tool spindle about its axis for cooperation with a second threaded element (**88**) for axially tightening a tool against a seat (**80**) of said tool driver means, and a spindle drive element (**32**) also coaxial to said tool spindle for driving the same, wherein

(a) drive connection means (**116, 118**) are provided for rotating said first threaded element (**86**) by said spindle drive element (**32**), and

(b) releasable clutch means (**60, 64, 40, 42**) are provided for coupling said spindle drive element (**32**) with said tool spindle (**30**), said clutch means comprising a clutch element (**60**) shiftable along the spindle axis between a first axial position in which said spindle drive element is coupled with the tool spindle, and a second axial position in which said first threaded element (**86**) is rotatable by said spindle drive element without rotation of the tool spindle.

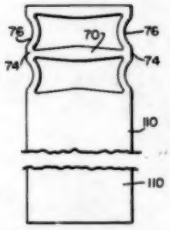
4,677,720
METHOD FOR MAKING A DOUBLE ROW ROLLER BEARING RETAINER

Richard L. Alling; Richard W. Shepard, both of Torrington, Conn.; Clyde L. Landrum, Granger, Ind.; Robert H. Tofield, Torrington, and Stephen T. Podhajecki, Norfolk, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 754,680, Jul. 12, 1985, Pat. No. 4,605,322, which is a continuation of Ser. No. 556,559, Nov. 11, 1983, abandoned. This application Apr. 7, 1986, Ser. No. 848,635

Int. Cl.[4] B21D *53/12;* **B21H** *1/12;* **B21K** *1/04, 1/05*

U.S. Cl. 29—148.4 C **3 Claims**



1. A method of making a double row roller bearing retainer from flat metal stock comprising the steps of:

making a plurality of pockets in a flat metal strip to provide pockets in the flat metal strip separated by cross-bars, and at the same time making scallops on each edge of the flat metal strip; shaping the cross-bars for roller guidance and for roller retention; U-forming the flat metal strip to provide a strip having a U-shaped cross-section; cutting off a predetermined length of the U-formed strip to provide a U-formed strip having two ends; wrapping the predetermined length into an annular retainer; and bonding the two ends together.

4,677,721
METHOD FOR FABRICATING AN ELASTOMERIC BEARING ASSEMBLY

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

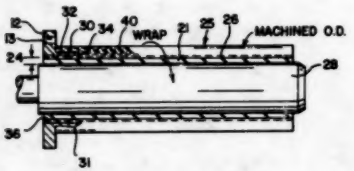
Division of Ser. No. 782,785, Oct. 2, 1985, Pat. No. 4,585,359. This application Dec. 26, 1985, Ser. No. 813,746

Int. Cl.[4] B21D *53/10;* **B31C** *13/00;* **B65H** *81/00;* **B32B** *1/00*

U.S. Cl. 29—149.5 S **7 Claims**

1. A method of manufacturing a bearing assembly comprising the steps of preforming a generally cylindrical elastomeric sleeve, providing at least a ply of fiber reinforced elastomer onto said elastomeric cylindrical sleeve to provide a fiber

reinforced cured elastomeric bearing blank, mounting the bearing blank onto a rotatable mandrel, applying an adhesive onto one exterior end surface of the bearing blank, mounting a metallic annular flange with an inwardly extending hub onto said one exterior surface of the bearing blank into frictional



contact with said adhesive, rotating said spindle and wrapping a fiber fabric onto the outer circumferential surface of the bearing blank and hub while impregnating the fiber fabric with a plastic resin, and curing said resin to complete a fiber reinforced shell that is molded into firm engagement with said hub and said bearing blank.

4,677,722

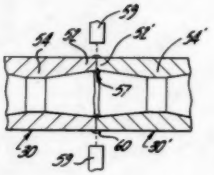
TAPERED PISTON PIN

Eric D. Emmer, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 16, 1985, Ser. No. 808,968

Int. Cl.[4] B23P *15/10;* **B21D** *31/02, 22/00*

U.S. Cl. 29—156.5 A **7 Claims**



1. A method of manufacturing a tubular piston pin having a cylindrical exterior surface and a contoured interior surface in the form of a double hourglass shaped aperture extending axially therethrough and characterized by opposite thin-walled end portions and midportion and by thicker-walled portions therebetween, comprising these steps:

supporting a metal cylinder in a cylindrical bore of a rigid housing, both having equal diameters;

molding the metal cylinder by moving a pair of dies in opposite directions each against an opposite end face of the metal cylinder to produce a substantially tubular half pin with thin-walled end portions and a thicker-walled midportion including a radially extending wall thereacross;

striking out the radially extending wall of the half pin to produce a continuous aperture axially through the half pin and having a substantially hourglass shape;

axially aligning two half pins and integrally joining the abutting ends thereof to produce a piston pin of twice the length of the half pin having a double hourglass configured aperture extending axially therethrough.

4,677,723

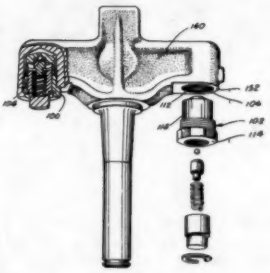
VALVE BRIDGE CONSTRUCTION METHOD

Hilliard F. Greene, Sr., Chicago, Ill., assignor to Precision Screw Machine Company, Hillside, Ill.

Division of Ser. No. 331,298, Dec. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 25,382, Mar. 30, 1979, abandoned, which is a continuation of Ser. No. 870,421, Jan. 18, 1978, abandoned, which is a continuation of Ser. No. 721,803, Sep. 8, 1976, abandoned. This application Apr. 9, 1984, Ser. No. 598,250

Int. Cl.[4] B21D *53/00*

U.S. Cl. 29—157.1 R **11 Claims**



1. An improved method of rebuilding a used valve bridge assembly of the type that actuates the exhaust valves in a cylinder of a diesel locomotive engine, said bridge including a cross-arm with distal ends and lash adjuster sockets adjacent to each of the distal ends, each of the lash adjuster sockets having an opening adapted to receive a lash adjuster by being press-fit therein in order to provide smooth, efficient operation of the exhaust valves, and said bridge having at least one lash adjuster socket with an inner diameter worn oversized so that a standard size lash adjuster can no longer be properly fitted therein, the improved method of:

maintaining a stock of oversized lash adjusters which each include an outer cylindrical wall having a radially outwardly projecting rib member adapted to be in surface-to-surface contact with the inner surface of the lash adjuster sockets and having an outer diameter dimension larger in diameter than the outer diameter dimension of the corresponding rib on the standard size lash adjuster;

disassembling the used valve bridge, including removing the used lash adjusters from each of the lash adjuster sockets;

cleaning the valve bridge, including the lash adjuster sockets formed therein, without machining the lash adjuster sockets in the valve bridge;

measuring the inner diameter dimension of each of the oversized lash adjuster sockets in the valve bridge;

selecting an oversized lash adjuster from said stock of oversized lash adjusters having an outer diameter dimension comparable to the measured inner diameter dimension of each of the oversized lash adjuster sockets; and

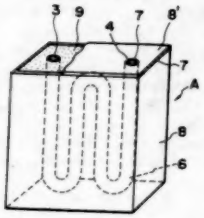
reassembling the valve bridge, including press-fitting the selected oversized lash adjuster into the measured lash adjuster socket so that the radially outwardly projecting rib member is in surface to surface contact with the inner surface of the measured lash adjuster socket.

4,677,724

HEAT EXCHANGER STRUCTURE AND METHOD OF MANUFACTURING SAME

Takanori Kuroki, 2-12-1, Hinosato, Munakata-shi, Fukuoka-ken, Japan

Filed Jun. 5, 1985, Ser. No. 741,535
Int. Cl.[4] B27D *53/02*; B23P *15/26*
U.S. Cl. 29—157.3 R **1 Claim**



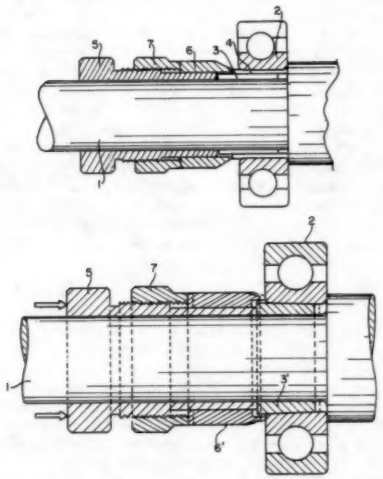
1. A process for making a heat exchanger comprising:
inserting a pipe having end portions, into a metal box having an inner surface in such a manner that said pipe is enclosed to form a fluid passage;
filling a space between said pipe and the inner surface of said metal box with at least one material selected from the group consisting of metal powder, metal particles, metal wires, and metal plates;
sealing said material in the space; and
diffusion-welding joint portions of said metal box to each other and peripheral surfaces of said end portions of said pipes to said metal box in an air-tight, vacuum-sealed state by hot isotropic pressure welding.

4,677,725

MOUNTING TOOL

Stig L. Hallerback, Vastra Frolunda, Sweden, assignor to Aktiebolaget SKF, Goteborg, Sweden

Continuation-in-part of Ser. No. 574,745, Jan. 30, 1984, Pat. No. 4,587,715. This application Dec. 23, 1985, Ser. No. 812,445
Claims priority, application Sweden, Mar. 7, 1983, 8301218
The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.
Int. Cl.[4] B25B *27/02*
U.S. Cl. 29—280 **1 Claim**



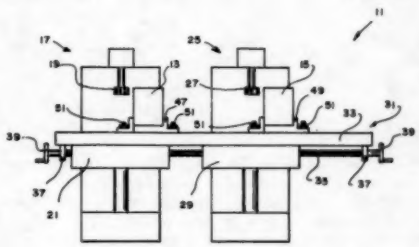
1. A mounting tool for mounting a bearing assembly including an inner ring having a tapered inner peripheral surface and an outer ring and a plurality of rolling elements in the annular space between the rings on a shaft member with a predetermined preload or play by means of a tapered sleeve confronting the tapered surface of the inner ring operable upon axial movement relative to the inner ring to exert a radial seating force on the inner ring of the bearing assembly comprising a mounting member movable axially on the shaft member and engageable with said sleeve member to actuate it axially relative to said inner ring, a spacing ring circumscribing the mounting sleeve and actuatable axially relative thereto and positioned to engage the inner ring when said mounting sleeve is moved axially to actuate the sleeve member and a stop ring having internal threads cooperating with threads on the mounting sleeve to selectively control the position of the spacing ring on the mounting sleeve and thereby control preload in the bearing assembly.

4,677,726

MILLING MACHINE APPARATUS

Clarence Williams, 2660 Dwight Rd., Memphis, Tenn. 38114

Filed Feb. 21, 1986, Ser. No. 831,622
Int. Cl.[4] B23Q *3/10*
U.S. Cl. 29—401.1 **3 Claims**



3. A method of modifying or converting two milling machines for simultaneously milling identical cuts into separate and distinct first and second workpieces wherein the method comprises:
(a) removing the carriage means of a first milling machine;
(b) removing the carriage means of a second milling machine; and
(c) operatively joining said first and second milling machines to one another with an elongated carriage means, said elongated carriage means including an elongated table attached to said first milling machine and to said second milling machine in a manner which allows longitudinal movement of said table relative to said first and second milling machines with said first and second workpieces attached to said table to allow said first and second milling machines to simultaneously mill said first and second workpieces respectively with the milling cutter of said first milling machine milling a cut into said first workpiece at the same time the milling cutter of said second milling machien is milling a cut into said second workpiece with said first and second workpieces being moved an identical amount with repsect to said milling cutters of said first and second milling machines respectively to cause identical cuts to be simultaneously milled into said first and second workpieces.

4,677,727

ANODE BUTTON FACING MACHINE

David E. Hochbein, Sarver, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 22, 1985, Ser. No. 714,798
Int. Cl.[4] B23B *35/00*
U.S. Cl. 29—402.06 **1 Claim**

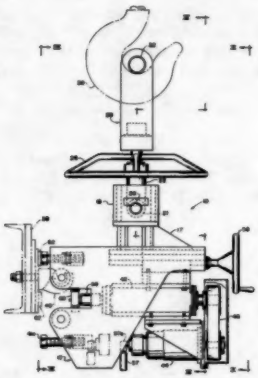
1. A method of machining a surface portion of an electrical

conductor while the conductor is conducting electrical current, the method comprising

providing hook means on said conductor for receiving a trunion of a portable machining apparatus,

providing said apparatus with a trunion, and with an air operated motor disposed to rotate a spindle and milling cutter mounted in the spindle,

insulating the portable apparatus from ground when said motor is connected to a source of pressurized air by using electrically insulating hoses connected between the motor and said source,



locating said milling cutter adjacent the electrical conductor by disposing the trunion in the hook means,

translating the spindle towards the electrical conductor until the cutter engages the same, and

rotating the cutter against a surface portion of the conductor by

directing a flow of air to the motor through said hoses from the source of pressurized air to rotate the motor and thus the spindle and cutter.

4,677,728

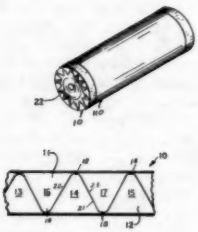
ROLL EDGE PROTECTOR

Albert E. Straus, 1673 W. Eighth St., Erie, Pa. 16505

Filed Jan. 27, 1986, Ser. No. 822,598

Int. Cl.[4] B23P *17/00*; A45C *11/34*

U.S. Cl. 29—415 **5 Claims**



1. A method of making a roll edge protector for rolls of sheet material comprising:

forming thermo plastic material into continuous lengths in the form of a channel having a first leg and a second leg and a web connecting said legs,

cutting said web along a continuous zig zag line from one end of said web to the other end, thereby forming a first continuous row of first scallops attached to said first leg and a continuous row of second scallops attached to said second leg,

said scallops having straight sides disposed at an acute angle to one another,

said scallops having arcuate tips and arcuate roots curved about equal radiuses of curvature.

4,677,729

METHODING OF MOUNTING A PARTLY FORMED LENS BLANK

Albert H. Morland, and John T. Phoenix, both of Southampton, England, assignors to Coopervision, Inc., Menlo Park, Calif.

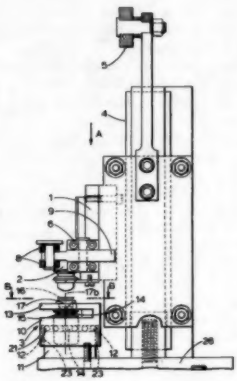
PCT No. PCT/GB85/00170, § 371 Date Dec. 18, 1985, § 102(e) Date Dec. 18, 1985, PCT Pub. No. WO85/04829, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 18, 1985, Ser. No. 816,120

Claims priority, application United Kingdom, Apr. 19, 1984, 8410341

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—426.5 **8 Claims**



1. A method of mounting a partly formed lens blank, having a first accurately cut lens surface, on an upper block in order to be able to cut a second opposite lens surface on the blank, said method comprising bringing the upper block into contact with the first accurately cut lens surface of the blank, said blank being secured on a lower support component, while maintaining the axes of the upper block and blank secured on said lower support component in a vertical disposition and, while supporting the lower support component and blank so that it is free to move in any direction in a horizontal plane, urging the first accurately cut lens surface and upper block together with a film of liquid adhesive therebetween, whereby said adhesive acts as a lubricant between mating surfaces of the upper block and the first accurately cut lens surface and assists centralisation and alignment of the axes of the blank and upper block, and removing said lower support component from said lens blank.

4,677,730

METHOD OF ATTACHING PRESS-IN FLANGE TO DRUM OR LIKE CONTAINER

Masanari Mineo, and Kinji Mineo, both of Arakawa, Japan, assignors to Yamato Iron Works Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 609,951, May 14, 1984, abandoned. This application Apr. 17, 1986, Ser. No. 854,078

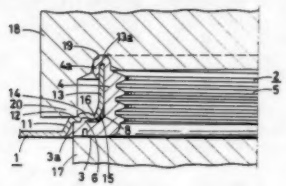
Claims priority, application Japan, May 12, 1983, 58-83741

Int. Cl.[4] B23D *11/00*; B65D *41/04*; B21D *51/46*

U.S. Cl. 29—512 **4 Claims**

1. An improved method of attaching a press-in flange 2

comprising a tubular portion **4** having an internally threaded part **5** and a horizontal portion **3** extending outward from the lower end of the tubular portion **4** and having a polygonal edge **3***a*, to a drum by fitting an annular gasket **8** around the tubular portion **4** of the flange **2**, forcing the flange **2** having the gasket thereon from below into a tubular mouthpiece **10** comprising a shirt portion **11** integral with the top plate **1** and polygonal in horizontal section, an annular stepped portion **12** extending horizontally inward from the upper edge of the skirt portion **11** and a tubular upstanding portion **13** made integral with the inner edge of the stepped portion **12** through a ccurved portion **14**, and outwardly bending the upper end **4***a* of the tubular portion **4** of the flange **2** to hold the upper end **4***a* folded over the upper end **13***a* of the upstanding portion **13** while brining the polygonal peripheral edge **3***a* of the horizontal portion **3** of the flange **2** into intimate contact with the inner surface of the



skirt portion **11** of the tubular mouthpiece **10**, wherein the improvement comprises:

(a) providing an upward annular projection **6** on the horizontal portion **3** of the flange **2** substantially at the midportion of its width;

(b) fitting said annular gasket **8** in between said annular projection **6** and the lower end of the tubular portion **4** before forcing the flange **2** into the tubular mouthpiece **10**; and

(c) bringing the annular projection **6** of the flange **2** into intimate contact with the inner surface of the curved portion **14** of the tubular portion **10** to thereby confine the gasket **8** into the space defined by the annular projection **6**, the curved portion **14**, the lower end of the tubular portion **4** and part of the horizontal portion **3**, when the flange **2** is forced nto the tubular mouthpiece **10** of the top plate **1** and fixed thereto.

4,677,731

PROCESS AND DEVICE FOR MOUNTING POROUS CERAMIC MATERIAL

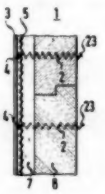
Jürgen Sommerer, Rauenthal; Michael Leipold; Hartmut Kainer, both of Wiesbaden, and Hermann Stein, Taunusstein, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 733,867

Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419566

Int. Cl.[4] **F16L** *59/12*

U.S. Cl. 29—526 R **15 Claims**



1. A process for mounting porous ceramic material to a metal surface to provide insulation for said metal surface, said process comprising the steps of:

disposing a perforated holding means in fixed relationship on said metal surface;

choosing porous ceramic material having a porosity of about 80% to about 90% and being of such hardness that spiral paths can be cut therein by spiral springs, and choosing spiral springs such that they can, on their own, cut spiral paths in the porous ceramic material when screwed thereinto;

placing said porous ceramic material adjacent to said holding means;

cutting helical paths in said porous ceramic material with spiral springs by screwing said spiral springs into said porous ceramic material;

engaging said spiral springs with said perforated holding means by continually screwing said spiral springs, thereby attaching said porous ceramic material to said metal surface; and

absorbing stresses with said spiral springs during use by deflection of said spiral springs, which stresses are at least caused by differences in thermal expansion between said porous material and said perforated holding means.

4,677,732

APPARATUS FOR LOOSE FEEDING OF ELECTRICAL COMPONENTS

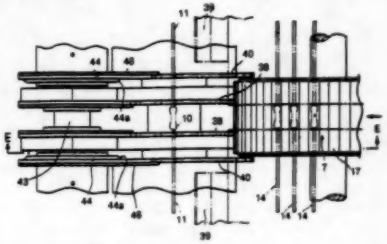
Harumi Furuya, Tokyo, Japan, assignor to Henry Mann, Inc., Huntington Valley, Pa.

Division of Ser. No. 645,944, Aug. 30, 1984, Pat. No. 4,573,501, which is a continuation of Ser. No. 522,064, Aug. 10, 1983, abandoned. This application Jan. 22, 1986, Ser. No. 803,468

Claims priority, application Japan, Oct. 30, 1982, 53-57191

Int. Cl.[4] **B21F** *1/02*

U.S. Cl. 29—563 **3 Claims**



1. An apparatus for receiving a plurality of loose electrical components, each having a body and leads extending outwardly therefrom, and for providing an output flow of generally parallel components spaced a predetermined distance apart, the apparatus comprising:

a receiver having at least one end for receiving and holding the loose components;

conveyor means proximate the one end of the receiver for conveying the components one by one from the receiver to provide the output flow, the conveyor means including a generally continuous arcuate conveyor member having an axis extending generally parallel to the one end of the receiver, the conveyor member being rotatable about the axis and being axially separated into two axial end sections and an axial center section therebetween, the axial end sections including a plurality of generally parallel, circumferentially spaced apart grooves extending generally axially along the surface thereof, the end section grooves being in registry and being sized to receive component leads, the axial center section having a plurality of generally parallel circumferentially spaced grooves extending generally axially along the surface thereof, the center section being adjustable with respect to the two end sections to permit registry of center section grooves with the end section grooves, the center section grooves being of different sizes, with the number of center section grooves

of each size corresponding to the number of end section grooves, the center section grooves being arranged so that when one center section groove of a particular size is in registry with one pair of end section grooves, all of the remaining center section grooves of the same size are in registry with the remaining end section grooves, the center section grooves being sized to receive component bodies; and

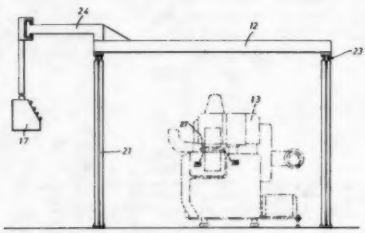
means for rotating the conveyor member about the axis at a predetermined rate to provide the output flow of components.

4,677,733

DEVICE IN WOODWORKING MACHINES

Bengt A. Andersson, Halmstad, Sweden, assignor to Waco Jonsereds AB, Sweden

Filed May 8, 1986, Ser. No. 860,865
Claims priority, application Sweden, May 13, 1985, 8502362
Int. Cl.[4] B23Q *39/04*
U.S. Cl. 29—563 **3 Claims**



1. A device for a woodworking machine of the type having plural working stations for performing consecutive working operations on workpieces fed through the machine along a worktable defining a path of travel, said machine having sufficient working stations permitting the required working of the workpieces when at least one working station is out of operation, the working stations being doubled for each working operation, and each working station being engageable and disengageable for operation independently of the other working stations, which device comprises:

(a) upwardly projecting protective means disposed along the path of travel of the workpieces on the worktable;

(b) cover means movable into a cooperating position with the protective means for forming a tunnel portion therewith at least at the working stations;

(c) a soundproof casing enclosing the working stations;

(d) the soundproof casing including a plurality of individual compartments defined by a plurality of external walls, a plurality of partitions and a roof, each compartment being separated from an adjacent compartment by a partition, and each compartment being provided with a door for permitting access thereto;

(e) a working station disposed within each compartment for performing a working operation therein;

(f) means for preventing unintentional activation of a working station that is out of operation; and

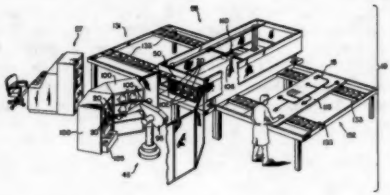
(g) means for interrupting the feeding of workpieces through the machine when the cover means is removed from the cooperating position at a working station which is out of operation.

4,677,734

ROBOTIC WIRE HARNESS ASSEMBLY SYSTEM

Joseph T. Bloch, and Dan A. Cross, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 539,768, Oct. 7, 1983, Pat. No. 4,520,966. This application Jun. 4, 1985, Ser. No. 741,318
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—564.2 **12 Claims**



1. A wire harness assembly system using robots to cut wires, to automatically configure the pre-cut wires, and to assemble the pre-configured wires into the desired wire harness, comprising:

(a) a wire preparation subsystem for selecting a predetermined wire and for cutting that wire to a predetermined length;

(b) a wire reeling subsystem, including a movable table having at least one wire canister holder and a wire canister for holding the pre-cut wire from the wire preparation subsystem;

(c) a wire terminating subsystem for configuring the ends of the wire within the canister;

(d) a wire queuing subsystem for holding the canister in a bay between the wire terminating subsystem and a layup subsystem;

(e) a layup subsystem including a layup robot which travels over a form board to position the wire in the canister into the predetermined pattern of the wire harness;

(f) a transport robot to move a loaded canister from the wire reeling subsystem to the wire terminating subsystem, and then to the queuing subsystem, and to move an empty canister from the queuing subsystem to the wire reeling subsystem; and

(g) logic control means associated with each of the subsystems for controlling automated assembly of a wire harness into a predetermined configuration.

4,677,735

METHOD OF PROVIDING BURIED CONTACTS FOR N AND P CHANNEL DEVICES IN AN SOI-CMOS PROCESS USING A SINGLE N+ POLYCRYSTALLINE SILICON LAYER

Satwinder D. S. Malhi, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 613,679, May 24, 1984, Pat. No. 4,621,276. This application Jan. 9, 1986, Ser. No. 817,381
Int. Cl.[4] H01L *21/425*
U.S. Cl. 29—571 **4 Claims**

1. A method of forming a silicon on insulator CMOS device using a single layer of doped polycrystalline silicon, comprising the steps of:

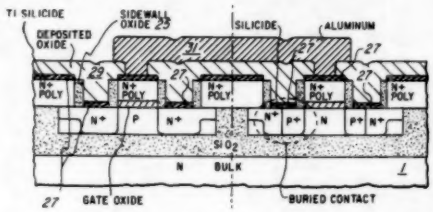
(a) providing an insulating ase member having at least two electrically isolated islands of silicon semiconductor material one of each pair of islands being of opposite conducting type than the other of said pair,

(b) forming a gate oxide in each of said islands,

(c) forming an N+ polycrystalline layer over said islands and said gate oxide,

(d) forming N+ regions in said islands adjacent said gate oxide,

(e) exposing surfaces of said islands including a portion of each of said N+ regions and a portion of the region adjacent thereto under gate oxide,
(f) masking a portion of the exposed surface in only said N-type doped island adjacent said gate oxide,
(g) introducing an N+ dopant into the exposed unmasked surfaces,
(h) removing said mask



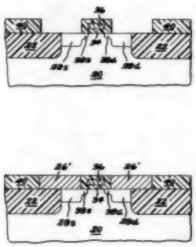
(i) doping siad exposed surface with a P+ type dopant sufficient to form P+ regions in the previously masked region and to retain an N+ doping level in all prior N+ doped regions,
(j) forming a silicide over the surface of each said island, and
(k) forming a conductive pattern coupled to the silicide of each of said gate oxide regions.

4,677,736

SELF-ALIGNED INLAY TRANSISTOR WITH OR WITHOUT SOURCE AND DRAIN SELF-ALIGNED METALLIZATION EXTENSIONS

Dale M. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 17, 1986, Ser. No. 853,108
Int. Cl.[4] H01L *21/283*
U.S. Cl. 29—571 **31 Claims**



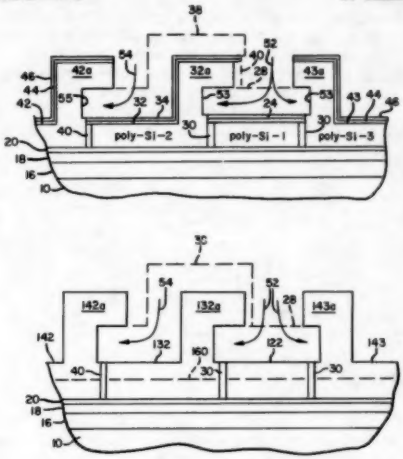
1. A method of fabricating field effect transistors, said method comprising the steps of:
forming an active region in a semiconductor substrate, said active region being surrounded by insultative material;
forming a first ion implantation mask layer in said active region, said first mask layer being disposed in substantially the pattern desired for a gate electrode for said field effect transistor;
forming doped regions in said active region on either side of said first mask layer so as to form source and drain regions in said semiconductor substrate;
depositing a second ion implantation mask layer over said substrate and planarizing said second mask layer at least down to the level of said first mask layer said first and second mask layers comprising distinct material;
removing said first mask layer;
forming oxide spacers ont he sidewalls of said second mask layer in said active region;
forming a gate insultative layer on said substrate between said sidewall spacers;
depositing conductive gate electrode material over said insulative gate material and between said sidewall spacers, whereby a gate electrode for said field effect transistor is formed;
planarizing said gate electrode material at least to the level of said second mask layer;
selectively removing said sidewall spacer material; and
forming less heavily doped regions on either side of said gate electrode in said semiconductor substrate.

4,677,737

SELF ALIGNED ZERO OVERLAP CHARGE COUPLED DEVICE

Brian L. Corrie, Gaston; Pauline Benn, Beaverton, and Michael J. McElevey, Tigard, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 23, 1986, Ser. No. 866,423
Int. Cl.[1] H01L *21/00, 21/58, 21/60*
U.S. Cl. 29—571 **16 Claims**



12. A method for making multiple adjacent gate structures in a charge coupled device including a semiconductor substrate having a reference surface, the method comprising:
providing a plasma-etch resistant layer on the reference surface to define a second reference surface,
depositing a first layer of plasma-etchable, polysilicion material on the plasma etch-resistant layer;
depositing a first shield layer atop an upper surface of the polysilicion layer, the shield layer being composed of a nonoxidizable, chemically-etchable material;
patterning and etching the shield and polysilicon layers in turn to form a first polysilicon gate contact and an adjacent second gate contact opening, the first contact having an exposed sidewall intersecting the second reference surface and defining a boundary of the second gate contact opening;
oxidizing the exposed sidewall of the first polysilicon gate contact to form thereon a dielectric sidewall layer of predetermined thickness spacing the first gate contact from the boundary of the second gate contact opening, the shield layer shielding the upper surface of the polysilicion gate contact from oxidation;
depositing a second layer of said polysilicon material so as to cover contiguously the oxidized layer in the second gate contact opening and the dielectric sidewall layer while leaving an upper surface portion of the shield layer exposed;

selectively etching the shield layer to remove the material thereof and from a passageway exposing an undersurface portion of the second polysilicon layer extending above the first polysilicon layer; and

selectively etching the exposed portion of the second polysilicon layer through said passageway to remove said portion.

4,677,738

METHOD OF MAKING A PHOTOVOLTAIC PANEL

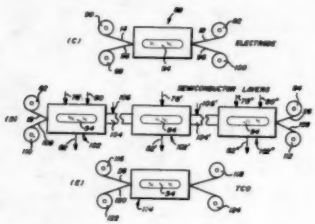
Masatsugu Izu, Birmingham; Vincent D. Cannella, Detroit, and Stanford R. Ovshinsky, Bloomfield Hills, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 750,444, Jul. 1, 1985, abandoned, which is a division of Ser. No. 653,019, Sep. 21, 1984, abandoned, which is a division of Ser. No. 402,115, Jul. 26, 1982, abandoned, which is a division of Ser. No. 151,301, May 19, 1980, Pat. No. 4,400,409. This application Mar. 3, 1986, Ser. No. 835,590

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.[4] H01L *31/18*

U.S. Cl. 29—572 **1 Claim**



1. A method of making a thin film silicon alloy photovoltaic panel comprising the steps of:

providing a substantially continuous web of flexible substrate material, said substrate material comprising a support layer having at least one substantially planar deposition surface with a layer of electrically insulating material thereupon;

providing one or more electrode-forming regions upon the layer of insulating material;

providing at least three discrete deposition chambers, each chamber including glow discharge means for the deposition of a discrete layer of thin film silicon alloy material; the conductivity type of the layer of silicon alloy material deposited in each chamber differing from one another;

substantially continuously feeding said web of substrate material through each of the deposition chambers;

introducing a plurality of reaction gases into each of the deposition chambers;

providing means between adjacent deposition chambers for isolating the reaction gases in each chamber from one another;

activating the glow discharge deposition means for disassociating said reaction gases and depositing a successive layer of silicon alloy material in each of the deposition chambers, said layers of silicon alloy material forming a photovoltaic region; and

forming a thin, flexible electrode layer on said last deposited layer of silicon alloy material.

4,677,739

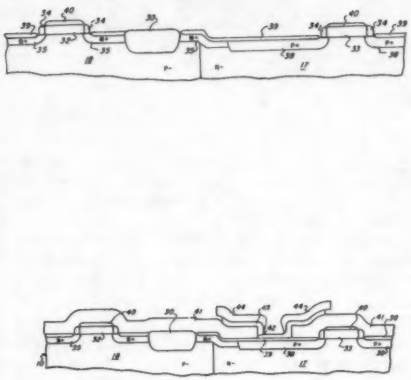
HIGH DENSITY CMOS INTEGRATED CIRCUIT MANUFACTURING PROCESS

Robert R. Doering, Plano; Michael P. Duane, and Gregory J. Armstrong, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1984, Ser. No. 676,351

Int. Cl.[4] H01L *21/265, 29/78, 27/04*

U.S. Cl. 29—576 B **9 Claims**



1. A method of making a CMOS twin-well semiconductor device, comprising the steps of:

implanting N impurity into a selected area of a face of a P type silicon body creating an N well area and growing a first oxide over said N well area.

implanting P impurity into said face using said first oxide as a mask to create a P well area, and subjecting said body to heat treatment to drive both said N well and P well into said face,

forming an oxidation mask over said face and opening a hole in said mask within said P well area, then etching a recess into the silicon of said face in said hole,

oxidizing said silicon in said recess to create a field oxide isolation area extending into said face, the field oxide having a top surface about level with said face,

applying a layer of conductive material on said face and patterning said layer to leave gates for transistors on said N well and P well areas,

implanting N+ impurity into both the N well and P well areas to create N+ source/drain for an N channel transistor in the P well area, using said gates as a mask,

implanting P+ impurity into only the N well area, using the gates and a photoresist coating as a mask, to create P+ source/drain regions in the N well area, at a concentration much higher than that in said N+ source/drain regions,

including the step of forming sidewall spacers on said gate layers prior to said steps of implanting,

and including the step of forming direct-reacted silicide on said source/drain regions,

said step of forming direct-reacted silicide being masked by said sidewall spacers on said gates.

4,677,740

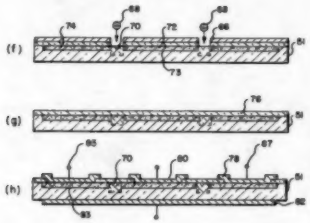
FORMING MONOLITHIC PLANAR OPTO-ISOLATORS BY SELECTIVE IMPLANTATION AND PROTON BOMBARDMENT

Gordon A. Shifrin, and Robert G. Hunsperger, both of Malibu, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 511,726, Jul. 8, 1983, abandoned, which is a continuation of Ser. No. 285,179, Jul. 20, 1981, abandoned, which is a continuation of Ser. No. 73,774, Sep. 10, 1979, abandoned, which is a continuation of Ser. No. 939,770, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 575,686, May 8, 1975, abandoned, which is a continuation of Ser. No. 375,227, Jun. 29, 1973, abandoned. This application Mar. 7, 1986, Ser. No. 838,409

Int. Cl.[4] H01L *21/265, 7/54*

U.S. Cl. 29—576 B **11 Claims**



1. A process for fabricating a planar monolithic electro-optical isolator comprising the steps of:

(a) selecting a semiconductive substrate capable of propagating radiation;

(b) implanting dopant ions into at least one predefined region of said substrate, which one region defines a radiation emitting region of said substrate;

(c) annealing said substrate for a predetermined time and temperature to electrically activate the ion-implanted region thereof;

(d) implanting protons into a second predefined region of said substrate adjacent to said radiation emitting region to define a semi-insulating region having increased electrical impedance and acceptable optical transmission characteristics;

(e) forming a radiation detecting region in a third predefined region of said substrate adjacent to said semi-insulating region and separate from said radiation emitting region; and

(f) forming metallic contacts over said radiation emitting and detecting regions to provide electrical input and output contacts.

4,677,741

METHOD OF MANUFACTURING PACKAGE FOR HIGH POWER INTEGRATED CIRCUIT

Shinobu Takahama, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 442,747, Nov. 18, 1982, abandoned. This application Jul. 10, 1986, Ser. No. 884,293

Claims priority, application Japan, Nov. 30, 1981, 56-194687

Int. Cl.[4] H01L *21/56*

U.S. Cl. 29—588 **2 Claims**

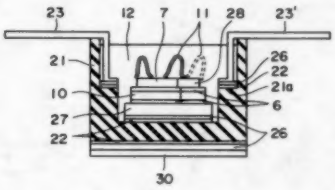
1. A method for manufacturing a semiconductor apparatus comprising the steps of:

preparing ceramic outer container in a box shape having an opening in an upper portion thereof and a bottom plate and also having a stepped portion at the position of an intermediate height of an inner wall thereof,

forming metalized layers on inner and outer surfaces of said bottom plate and the surface of said stepped portion,

brazing by a hard solder a common metal substrate onto the metalized layer on the inner surface of said bottom plate simultaneously with brazing by a hard solder a metal plate onto the metalized layer of the outer surface of said bottom plate,

brazing by a hard solder a plurality of external electrodes of a conductor plate frame shape on the metalized layer on the surface of said stepped portion,



brazing by a soft solder a heat sink plate on said common metal substrate,

brazing by a soft solder a semiconductor chip on said heat sink plate,

electrically connecting said semiconductor chip to said metal plate and said external electrodes, and

filling a soft sealing resin in said outer container.

4,677,742

ELECTRONIC MATRIX ARRAYS AND METHOD FOR MAKING THE SAME

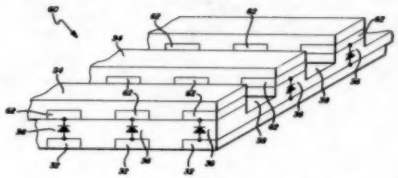
Robert R. Johnson, Franklin, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 458,919, Jan. 18, 1983, abandoned. This application Dec. 5, 1983, Ser. No. 558,216

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] H01L *23/52, 45/00*

U.S. Cl. 29—591 **16 Claims**



1. A method of forming an electronic matrix array atop a non-conductive surface formed of a non-conductive material comprising:

forming a first set of parallel, spaced apart address lines on the non-conductive surface, the address lines being electrically isolated from one another;

depositing a plurality of continuous layers of semiconductor materials directly atop the non-conductive surface and the first address lines to form a continuous, selection means structure over the non-conductive surface and the first address lines; and

forming a second set of parallel, spaced apart address lines on the continuous selection means structure on the side thereof opposite the non-conductive surface and the first set of address lines with said second set of address lines crossing said first set of address lines at an angle for forming a plurality of crossover points therewith through which selected current paths can be established between respective address lines of said first and second sets of address lines.

4,677,743

WINDING METHOD

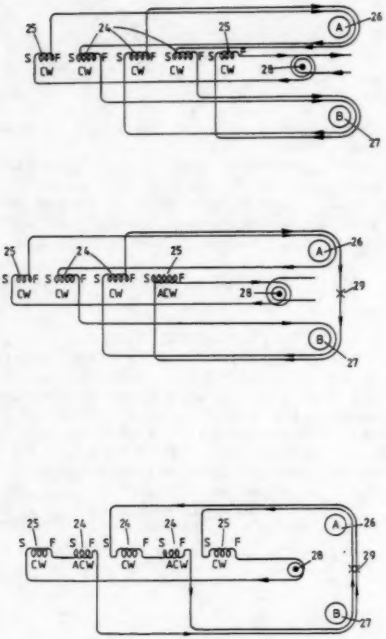
Frank M. Logie, London, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed May 29, 1986, Ser. No. 868,619

Claims priority, application United Kingdom, Jun. 18, 1985, 8515352

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—596 2 Claims



1. A method of winding the coils of a stator structure of an electromagnetic device of the kind in which the stator structure is of cylindrical form and defines a plurality of axially spaced circumferential pole pieces, adjacent pole pieces defining a groove therebetween and grooves, the coils being located in the grooves respectively and connected to a pair of electric supply terminals at one end of the stator structure, the end coils having a reduced number of turns and being connected in series with each other, the method comprising providing a dummy connector terminal at said one end of the stator structure, connecting the wire to be used in winding the coils to said dummy connector terminal, laying the wire in a slot extending longitudinally along the stator structure, winding the end coil further from said one end of the stator structure and returning the wire to one of the supply terminals directly or by way of an intermediate coil, then winding the remaining intermediate coils starting with the one furthest from said one end of the stator structure and then winding the end coil at or nearest said nearest one end of the stator structure, one end of said end coil being connected to said dummy connector terminal.

4,677,744

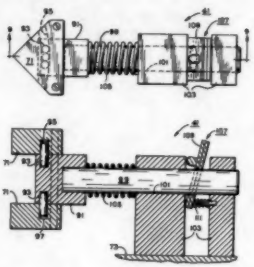
APPARATUS FOR ASSEMBLING A ROTATABLE ASSEMBLY

Alexander Mulier, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 630,872, Jul. 13, 1984, Pat. No. 4,587,721, which is a continuation-in-part of Ser. No. 616,200, Jun. 1, 1984, Pat. No. 4,586,244, which is a continuation-in-part of Ser. No. 593,840, Mar. 27, 1984, Pat. No. 4,608,752. This application Mar. 20, 1986, Ser. No. 841,985

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—729 7 Claims



7. Apparatus comprising:

a support;

means associated with said support and operable generally for reciprocal movement in one direction and another direction opposite thereto;

resilient means associated with said support and said reciprocal means and operable generally for opposing the movement of said reciprocal movement means in one of the one and another directions;

wedge means associated with said reciprocal movement means for conjoint movement therewith and for pivot movement relative thereto;

means associated with said wedge means and said reciprocal movement means for accommodating both the pivotal movement of said wedge means relative to said reciprocal movement means and the conjoint movement therewith of said wedge means; and

means associated with said support and said reciprocal movement means and operable generally for releasably retaining said reciprocal movement means against movement in the other of the one and another direction in response to the operation of said resilient means.

4,677,745

APPARATUS FOR AUTOMATICALLY MOUNTING SPECIAL-TYPE CHIPS ON SUBSTRATE

Keiichi Ihara, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 741,305

Claims priority, application Japan, Jun. 7, 1984, 59-84548[U]; Jul. 17, 1984, 59-107937[U]; Jul. 26, 1984, 59-113790[U]; Jul. 26, 1984, 59-113791[U]; Sep. 4, 1984, 59-183676; Sep. 24, 1984, 59-143977[U]; Sep. 24, 1984, 59-143978[U]; Apr. 15, 1985, 60-54708[U]; May 20, 1985, 60-73513[U]

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—741 17 Claims

1. An apparatus for automatically mounting electronic components on a substrate comprising:

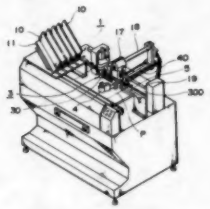
a support;

means fixed to said support for individually and successively feeding electronic components to a mounting means and including at least one cartridge obliquely arranged, said at least one cartridge including first storage means for carry-

ing vertically stacked magazines adapted to store said electronic components therein, and second storage means laterally adjacent said first storage means for receiving empty vertically stacked magazines therein; a transfer means coupled to a lower end of said cartridge to receive an electronic component sliding out of said cartridge under the pull of gravity and being movable to transfer an electronic component to a predetermined position; and a stopper means mounted on said transfer means for stopping said electronic component being pulled down by gravity within the transfer means;

said mounting means comprising means carried on said support for reciving said electronic component from said feeding means and placing it on said substrate;

positioning means movably mounted on said support for



moving at least one of said transfer means and said mounting means relative to the other to bring the electronic component from the cartridge to the mounting means;

a terminal clinching means carried on said support for cutting and bending terminal pins of said electronic component projecting from the bottom of said substrate; and

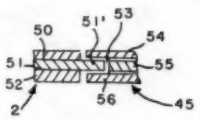
a device carried on said support for automatically replacing a just-emptied magazine from the lowest position in the vertical stack of said magazine in the first storage means including a first pusher means carried on said support for laterally transferring an empty magazine from said first storage means to the second means, and a second pusher means carried on said support for vertically moving said empty magazine upward in said second storage means, said first and second pusher means being arranged below said cartridge.

4,677,746

ASSEMBLY FOR ATTACHING A CUTTER BLADE INTO A CHAIN SAW

Juhani Raiski, P.O. Box 26 SipiläSF-34801 Virrat, Finland

Filed Dec. 17, 1985, Ser. No. 810,005
Claims priority, application Finland, Dec. 21, 1984, 845087
Int. Cl.[4] B27B *17/00*
U.S. Cl. 30—122 **13 Claims**



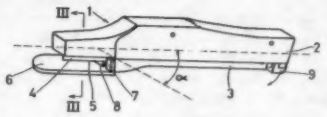
1. A chain saw assembly, comprising a main frame having a power unit and a drive member, an auxiliary frame removably connected to the main frame and having a cutter blade to carry an endless cutter chain and a power transmission unit, said power transmission unit including a driven member, connecting means for operably connecting said drive member to said driven member, said connecting means arranged to transmit rotation from said drive member to said driven member and permit relative axial movement between said members, fastening means separate from said members for releasably connecting said auxiliary frame to said main frame, and a driving element disposed on said auxiliary frame coaxially of said driven member, said driving element being operably connected to said driven member and engaged with said chain to drive said chain, release of said fastening means enabling said auxiliary frame to be removed from said main frame without disengagement of said drive element from said chain.

4,677,747

VEGETATION STEM CUTTING APPARATUS

Brian A. Winer, P.O. Box 960, Sandton 2144 Transvaal, South Africa

Filed Mar. 13, 1986, Ser. No. 839,169
Int. Cl.[4] B26B *17/00, 13/26*
U.S. Cl. 30—124 **11 Claims**



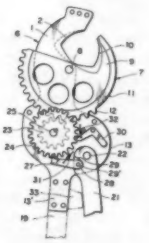
1. Cutting apparatus comprising a pair of elongate limbs extending in the same general direction and operatively connected to each other by connecting means which guide the limbs for movement towards and away from each other while simultaneously remaining parallel relative to each other, and whereof one limb is adapted to carry a cutting blade having a cutting edge directed towards a support surface provided on the other limb, the support surface and blade being adapted to co-operate upon relative movement of the limbs to provide a cutting action, said other limb carrying the support surface also having a split end wall for accomodating said blade passing through the split thereof, and said one limb which is adapted to carry the cutting blade having a slot therethrough for downwardly receiving the cutting blade, and including a removable retaining member for closing, in the operative position, the side of the slot remote from the cutting surface, the retaining member carried by said one limb for endwise movement thereon into and out of said position in which the closing member is located directly above the split end wall.

4,677,748

HAND-OPERATED CABLE CUTTER

Mituharu Kobayashi, Sanjo, Japan, assignor to Kobayashi Tools Mfg. Co., Ltd., Niigata, Japan

Filed Dec. 9, 1986, Ser. No. 943,939
Claims priority, application Japan, Dec. 20, 1985, 60-287564
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—250 **9 Claims**



1. A hand-operated cable cutter comprising:

a first stationary cutter blade having a first curved jaw which is formed along its one lateral side with a first cutting edge;

a second movable cutter blade having a second curved jaw

which is formed along its one lateral side with a second cutting edge in an opposing relation with said first cutting edge, said movable cutter blade being pivotally connected to said stationary cutter blade for swinging and sliding movement relative to said stationary cutter blade;

gear teeth provided on said movable cutter blade;

a drive mechanism including a small gear kept in engagement with said gear teeth, a large ratchet wheel mounted concentrically with and for rotation with said small gear, a knob connected to said small gear, a driving pawl held engageable with said ratchet wheel to rotate said ratchet wheel in one direction, and a detent pawl kept in engagement with said ratchet wheel to prevent rotation of said ratchet wheel in the opposite direction;

a first stationary handle having a distal end portion to which said stationary cutter blade is secured; and

a second swing handle having a distal end portion mounted pivotally relative to said first cutter blade and stationary handle, with said driving pawl pivotally connected thereto so that pumping strokes of said swing handle relative to said stationary handle cause said driving pawl to rotate said ratchet wheel and hence said small gear in said one direction to thereby close said second cutting edge relative to said first cutting edge for performing the cutting operation on a workpiece to be cut and, when said driving pawl and detent pawl are disengaged from said ratchet wheel, free rotation of said ratchet wheel and small gear being permitted to allow said second cutting edge to be moved either away from or toward said first cutting edge by the use of said knob.

4,677,749

BLADE SET FOR AN ELECTRICAL KNIFE

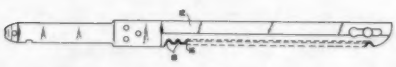
Marc P. Brison, Saint-Lô , France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Filed Dec. 30, 1985, Ser. No. 814,737

Claims priority, application France, Jan. 30, 1985, 85 01286

Int. Cl.[4] B26B *9/02*

U.S. Cl. 30—355 **8 Claims**



1. A blade set for an electrical knife, said blade set comprising first and second elongate blades, each of said blades having an elongate inner face, an elongate outer face, and elongate top and bottom edges each joining said inner and outer faces, said first and second blades being arranged to extend in respective parallel planes with their inner faces facing towards each other and being joined together, each of said first and second blades having a plurality of indentations in its bottom edge defining a series of projecting teeth, each tooth having two side edges defining a projecting tip, a respective concave notch being formed in the projecting tip of a plurality of said teeth, each said notch being arranged to define, together with the side edges of the respective tooth, two points at the tip of said tooth, each indentation having a chamfer which extends from the inner face to the outer face of the blade and defines a cutting edge on said inner face, and each said notch being also chamfered in the direction from the inner face of the blade to the outer face of the blade, the angle between the inner face of the blade and the chamfer of the indentations being less than the angle between the inner face of the blade and the chamfer of said notches.

4,677,750

GUIDE ARRANGEMENT FOR A PORTABLE POWER SAW

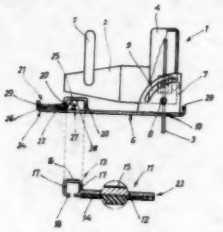
Peter Maier, Gerokstrasse 1, D-7311 Neidlingen, and Gernot Hänsel, Gerstenstrasse 31, D-7000 Stuttgart 70, both of Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,336

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341003

Int. Cl.[4] B23D *47/02*

U.S. Cl. 30—376 **7 Claims**



1. A guide structure for a portable power saw comprising a guide plate adapted to be laid on a piece of work to be sawed with said saw, a proud rail forming part of said guide plate and running in a feed direction of said saw, a stand plate mounted on said saw, said stand plate being adapted to fit onto said guide plate and being able to be moved along said rail in said feed direction, said stand plate having guide sections straddling said rail and engaging over opposite sides thereof, a backlash limiter acting between said stand plate and said guide plate to take up play between the rail and said guide sections while allowing motion of said saw along said rail, said backlash limiter being mounted on said stand plate and comprising an operative part adapted to act against a side face of said rail, said operative part being adapted to move in a direction normal to the direction of the rail and protruding through a gap in the said stand plate and past a face thereof turned toward said rail, and a helical compression spring for urging said operative part, that is in the form of a sliding shoe, against the rail.

4,677,751

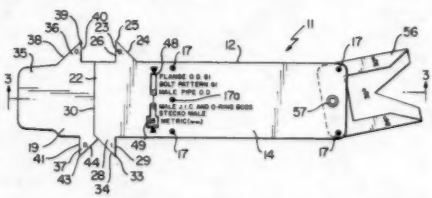
DEVICE AND METHOD FOR DETERMINING HOSE SIZE AND HOSE FITTING STYLE AND SIZE

David A. Masseth, Washington Township, Montgomery County, Ohio, assignor to Dayco Products, Inc., Dayton, Ohio

Filed Oct. 1, 1984, Ser. No. 655,815

Int. Cl.[4] G01B *5/24*

U.S. Cl. 33—143 M **16 Claims**



1. In a device for measuring features of a hose or fitting, the improvement comprising a flat body which includes at least two superimposed flat sheets having viewing means and means for separating said sheets therebetween secured together by fastening means, said sheets and said separting means forming a slot between said two sheets, one end of said body having a

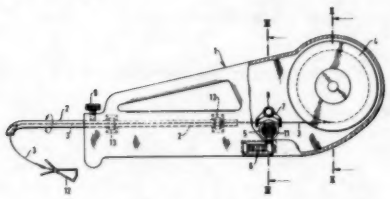
plurality of superimposed members, each member having a different configuration for measuring a tapered extremity to determine the type of said fitting, the other end of said body having a measuring means to measure a fitting or hose to determine the size thereof at least one portion of said measuring means being attached to one of said flat sheets, a third flat sheet slidably mounted between said two superimposed flat sheets and having at least one portion of said measuring means for cooperating with said portion on said one of said two flat sheets and having indicia correlated with the relationship between said dimensions determined by said measuring means and a plurality of standard industrial indentification systems whereby said hose or fitting is identified by an indicia on said third sheet in said viewing means.

4,677,752

MANUAL MEASURING TOOL FOR ROLLS OF MATERIAL

Matthias J. Auchter, Morlauterer Strasse 11, 6750 Kaiserslautern, Fed. Rep. of Germany

Filed Apr. 17, 1986, Ser. No. 852,992
Int. Cl.[4] G01B *3/02*
U.S. Cl. 33—128 **5 Claims**



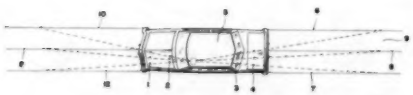
1. A tool for measuring rolls of material comprising a housing and measuring thread spool rotatably mounted in said housing having a supply of measuring thread thereon, a delivery tube rotatably mounted in said housing and having one end aligned with said spool and an opposite end extending out of said housing, said measuring thread extending from said spool through said tube at one end and through said tube and out of said tube opposite end, said measuring thread having means at its outer end for engagement thereof of the material to be measured, a counter having a spool means rotatably mounted in said housing adjacent said spool means, said measuring thread having a turn extending around said spool means so that said spool means is rotated during payout of said measuring thread, said spool means having a cylindrical surface over which the thread is engaged which varies in diameter along its length and means associated with said spool means for positioning the measuring thread so as to engage around the selected portion of the circumference of said pool means.

4,677,753

COLLISION RISK ASSESSMENT SYSTEM

John J. Loggers, P.O. Box 62, Red Bank, N.J. 07701

Filed Feb. 18, 1986, Ser. No. 830,441
Int. Cl.[4] G01C *21/04*
U.S. Cl. 33—264 **1 Claim**



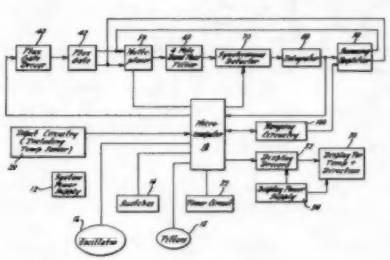
1. A vehicular distance judgment device comprising a plurality of sights mounted in groups on the front and rear of a vehicle within the line of sight of the vehicle's operator, said sights being illuminated and adjustable laterally for assisting said operator to judge the position of the vehicle relative to objects in the path of said vehicle, wherein said device includes a base having a channel formed therein, and each said plurality of sights comprising a housing illumination means mounted in said housing, and means connected between said housing and said base for adjustably mounting said housing on said base in said channel, said mounting means includes a slidably mounted locking member mounted in said channel, screw threaded means connected between said locking means and said housing, and washer means connected between said screw threaded means and said locking means for supporting and anchoring said screw threaded means, and a further plurality of sights mounted between the location of the first set of sights and the operator to establish the line of sight, and said base including means for supplying power to said illuminating means.

4,677,754

MULTIPLEXING OF A BANDPASS FILTER CIRCUIT TO WORK WITH A FLUX-GATE SENSOR OUTPUT

Ronald F. Hormel, Mount Clemens, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 27, 1985, Ser. No. 814,125
Int. Cl.[4] G01R *33/02;* **G01C** *17/30*
U.S. Cl. 33—361 **1 Claim**



1. A multiplexed control circuit for an electronic compass including a microcomputer, a flux-gate, a flux-gate driver, a bandpass filter, a synchronous detector, an integrator, a summing amplifier, and a ranging circuit the multiplexed control circuit comprising:

a gate switch connected at its input to the flux-gate for each magnetic component to be measured;

a switching network, controlled by the microcomputer;

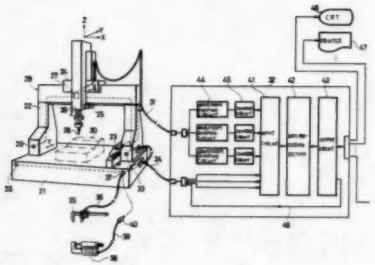
the gate switches commonly connected at their outputs to the serial connection of the bandpass filter, synchronous detector, integrator and summing amplifier;

the microcomputer sending signals to the switching network such that the gate switches for each magnetic component are controlled, alternately conducting, thereby alternately allowing the output of the flux-gate to pass through to the serial connection of the bandpass filter, synchronous detector, integrator and summing amplifier whereby the effects of gain and component tolerances on the control circuit is minimized.

4,677,755
COORDINATE MEASURING INSTRUMENT

Hideo Iwano, and Kazuo Shudo, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00596, § 371 Date May 16, 1986, § 102(e) Date May 16, 1986, PCT Pub. No. WO86/02720, PCT Pub. Date May 9, 1986
PCT Filed Oct. 28, 1985, Ser. No. 871,428
Claims priority, application Japan, Oct. 29, 1984, 59-227535
Int. Cl.[4] G01B 7/03
U.S. Cl. 33—503 9 Claims



1. A coordinate measuring instrument having a measuring element supported in a manner to be movable relative to a work to be measured rested on a mount tridimensionally, i.e. in the directions of X-, Y- and Z-axes, said work having a shape which is measured from a displacement value between said work and said measuring element, comprising:

X-, Y- and Z-axis displacement detector means for detecting the relative displacement values in the directions of said X-, Y- and Z-axes between said work and said measuring element;

at least one portable detecting unit including a reciprocatingly movable contact and a contact displacement detector for detecting a displacement value of said contact;

each said X-, Y- and Z- axis displacement detector means and said contact displacement detector of said detecting unit being connected to an input circuit of a processing unit having a data processing section and an output circuit;

said output circuit providing output signals commensurate to displacement values from each said X-, Y- and Z- axis displacement detector means and said contact displacement detector of said detecting unit being utilized to make said processing unit able to measure the shape of said work;

means defining a plurality of jacks electrically connected to said input circuit of said processing unit, said jacks being spaced from one another around said mount; and

said detecting unit being connected through a cable having a plug on an end thereof received in a one of said jacks to said input circuit in a manner to be accessible to any one object surface of measurement of said work rested on said mount.

4,677,756
MEASURING INSTRUMENTS FOR MEASURING DEPTH OF CAVITIES

Lewis A. Simon, Stanmore, England, and Michael F. Scarffe, Milton Keynes, United Kingdom, assignors to VS Remek Limited, Luton and LJS Practice Management Limited, Stanmore, both of, England

Filed Mar. 20, 1986, Ser. No. 841,754
Claims priority, application United Kingdom, Mar. 21, 1985, 8507319
Int. Cl.[4] A61B 5/05
U.S. Cl. 33—514 18 Claims

1. An instrument for measuring the depth of a cavity comprising:

a housing member;

a probe including a probe element and a sheath, said probe element being slidable within said sheath so as to protrude therefrom by a variable amount, one of said probe element and said sheath being mounted to said housing member;

a slider disposed in said housing member and coupled to one of said probe element and said sheath for sliding movement therewith;

an electrical coil winding disposed within said housing member;

a magnetic flux transmitting core disposed within said housing member and operatively coupled to said coil winding, one of said core and said coil winding being fixed relative to said housing member and the other of said core and said coil winding being operatively coupled to said slider so as to be movable therewith to vary the inductance of said coil winding upon movement of said slider;

means for producing a signal corresponding to the inductance of said coil winding so as to be indicative of the disposition of the slider relative to said housing member thereby constituting a depth signal representative of the amount of protrusion of said probe element from said sheath, said means for producing a signal including:

(a) means for applying a voltage to said coil winding:

(b) switch means for controlling said applying means;

(c) means for measuring current through said coil winding;

(d) means for operating said switch means so as to cut off said applying means when the measured current exceeds an upper threshold value;

(e) means for operating said switch means to apply voltage from said applying means when the measured current is below a lower threshold value; and

(f) frequency measuring means for measuring the frequency of operation of said switch means to produce said signal representative of the inductance of said coil winding;

means for monitoring the rate of change of said depth signal; and

means for recording and/or displaying a value corresponding to said depth signal when the rate of change of said depth signal reaches a predetermined value.

4,677,757
OVEN

Michael Debenham, Frankston, and James D. Farfor, Cannons Creek, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

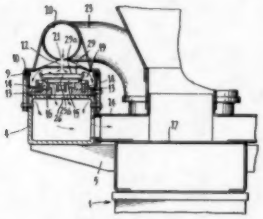
Filed May 29, 1984, Ser. No. 614,648
Claims priority, application Australia, Jun. 2, 1983, PF9664
Int. Cl.[4] F26B 3/28; B05D 7/22
U.S. Cl. 34—4 3 Claims

1. A method of heating can ends in an oven, said can ends

having an upper surface and a lower surface, said method comprising:

at least partially coating said lower surface of said can ends with a heat-curable coating;

providing an oven comprising an elongate heating chamber, a source of heat, disposed within said heating chamber, and conveying means, disposed beneath said source of heat, for conveying said can ends through said heating chamber, said conveying means including support means, engageable of said can ends, for supporting said can ends without contacting said heat-curable coating;



supporting said can ends on said support means with said lower surface directed downwardly;

conveying said so-supported can ends through said elongatge heating chamber on said conveying means beneath said source of heat;

applying heat from said source of heat to said upper surface of said can ends to heat said upper surface of said can ends;

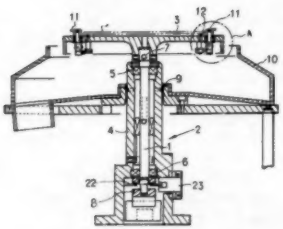
conducting heat through said can ends from said heated upper surface to said lower surface to cure said heat-curable coating on said lower surface, whereby said heat-curable coating is cured principally by heat absorbed by said can ends.

4,677,758

SPIN DRIER FOR SEMICONDUCTOR MATERIAL

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Japan

Filed Oct. 4, 1985, Ser. No. 784,569
Int. Cl.[4] F26B *11/18*
U.S. Cl. 34—58 **8 Claims**



1. A spin drier for semiconductor material, which comprises;

a vertical shaft rotatably mounted within a housing;

a horizontal rotary table located on the top of the shaft;

support members positioned in the table and upwardly projecting from the table surface for supporting thereon semiconductor material;

holding members to be contacted with the outer periphery of semiconductor material supported on the table;

three or more chuck members for holding upper surface portions of the outer periphery of the support semiconductor material;

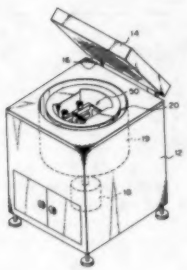
each of said chuck members comprising a pin which passes through the table, a chuck part mounted on the top of said pin which during rotation of the table passes over the top of the supported semiconductor material, thereby holding the semiconductor material against any rise thereof, a weight eccentrically attached to said pin under the table, and a spring member for restoring said chuck part during non-rotation of the table to a determined angular position where said chuck part does not pass over the top of the semiconductor material.

4,677,759

ROTARY DRIER APPARATUS FOR SEMICONDUCTOR WAFERS

Kazuhiko Inamura, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Minato, Japan

Filed Jul. 8, 1986, Ser. No. 883,696
Claims priority, application Japan, Jul. 8, 1985, 60-148331
Int. Cl.[4] F26B *17/32*
U.S. Cl. 34—58 **5 Claims**



1. An apparatus for drying semiconductor wafers on wafer carriers by centrifugal force, said apparatus comprising:

a turntable;

a pair of cradles, each mounted adjacent to each other on said turntable for rotation therewith for removably carrying a wafer carrier therein;

means, including a motor and a shaft, for driving said turntable in rotation on said shaft;

a container housing said turntable at a lower position therein, said container having side walls for receiving splatterings from semiconductor wafers on the wafer carriers carried by the cradles when said turntable is rotated by said driving means, an upper opening through which the wafer carriers are vertically removable from said turntable and said container, and a bottom plate having a hole in a middle portion thereof, said shaft extending vertically upward through said hole from said motor to a middle portion of said turntable;

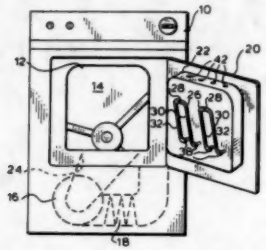
a pair of supporting members fixedly mounted on a surface of said turntable, horizontally spaced apart on opposite sides of said middle portion of said turntable, said cradles being disposed between and pivotably mounted to said supporting members on opposite sides of said middle portion of said turntable for pivotal movement about respective parallel horizontal axes extending between said supporting members, said cradles having respective centers of gravity spaced from said axes so as to provide a turning moment biasing the bottom ends of said cradles toward each other, such that rotation of said turntable pivots said cradles about said axes radially outward of said turntable by centrifugal force; and

stopper means, disposed between said cradles so as to abut said cradles when said turntable is not rotating, for preventing said cradles from touching each other when said turntable is not rotating.

4,677,760
DRIER STORABLE RACK

Robert M. St. Louis, St. Leonard, Canada, assignor to Camco Inc., Mississauga, Canada

Filed Sep. 17, 1986, Ser. No. 908,169
Claims priority, application Canada, Oct. 11, 1985, 492882
Int. Cl.[4] F26B *20/00*
U.S. Cl. 34—90 10 Claims

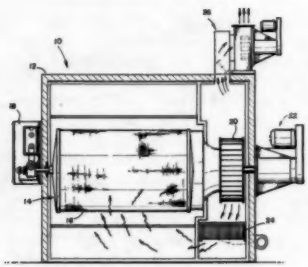


1. A clothes drier comprising:
a housing;
a rotatable drum mounted to rotate in said housing;
heater means;
means for circulating air heated by said heater means through said drum;
an access passage to said drum;
a door closing said access passage and having a bulkhead projecting into said passage to close off said passage;
rack means selectively movable between an operative position within said drum and a stored, non-operative, position;
means for mounting said rack means on said bulkhead in said operative position, said means for mounting said rack means on said bulkhead including means forming part of said bulkhead for anchoring said rack means to said bulkhead to project inwardly in a cantilever fashion into said drier drum; and,
means for holding said rack means in said stored non-operative position wherein said rack means is contained by said bulkhead within said access passage.

4,677,761
SIEVE DRUM

David Rattner, Box 104, Solebury, Pa. 18963

Filed Feb. 13, 1986, Ser. No. 828,890
Int. Cl.[4] F26B *25/20*
U.S. Cl. 34—108 12 Claims

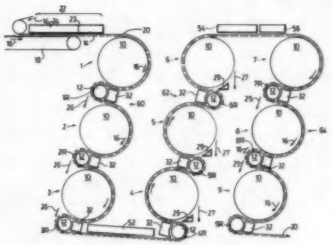


1. A sieve drum for heat treating a web material comprising:
a drum surface made exclusively of a close mesh screen cylindrically shaped and self-supporting for conveying the web material upon said screen under rotation, said screen comprising a plurality of longitudinal and transverse wire lengths of a relatively heavy gauge interwoven in a sinusoidal fashion to form a multitude of interstitial openings each with rounded edges, the aggregate area of said openings being less than 50% of the surface of said screen; and
a pair of circular heads attached to either end of said screen.

4,677,762
DRIER FELTING ARRANGEMENT

Ralph J. Futcher, Beaconsfield, Canada, assignor to Valmet-Dominion Inc., Lachine, Canada

Filed Nov. 29, 1985, Ser. No. 802,728
Claims priority, application Canada, Dec. 20, 1984, 470741
Int. Cl.[4] F26B *13/08*
U.S. Cl. 34—114 6 Claims

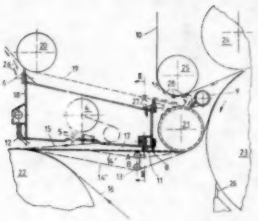


1. A drier felt arrangement comprising a plurality of drier drums each having an outer drying periphery around which a felt is trained, said felt passing around each of said drier drums in sequence, at least one turning roll interposed between each successive drum in said sequence, said turning rolls having smaller radii than said drier drums; one surface of said felt travelling over each of said drums in facing relation thereto, the opposite surface of said felt travelling in a face-to-face relationship around the peripheries of each of said turning rolls as said felt traverses each turning roll, means to apply a web to be dried to said one surface whereby said web is sandwiched between said felt and each said drier drum outer surface in succession as said felt passes in succession over said drier drums, a blow box located adjacent each of said turning rolls, each said blow box having a working surface adjacent said felt as the felt traverses the gap between each said drum and the oncoming side of next turning roll onto which said felt passes, each said blow box directing airflow along said working surface between said felt and said working surface to prevent contact between said felt and working surface and to prohibit drag forces associated with said working surface of said blow box from acting against said felt and directing airflow in a direction away from said next turning roll in a manner to induce further air flow and reduce the pressure on said opposite side of said felt and move air away from its adjacent of said turning rolls thereby to hold said web to said felt as said felt traverses each said turning roll.

4,677,763
DEVICE FOR TRANSFERRING A PAPER WEB FROM THE PRESS SECTION TO THE DRYING SECTION OF A PAPER MACHINE

Gerhard Kotitschke, Steinheim, and Hans-Werner Höricke, Deggendorf, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Continuation of Ser. No. 676,789, Nov. 30, 1984, abandoned.
This application Sep. 23, 1986, Ser. No. 912,134
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344217
Int. Cl.[4] F26B *13/08*
U.S. Cl. 34—116 7 Claims

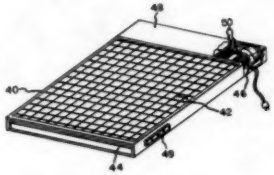


1. In a device for transferring a paper web from the press section to the drying section of a paper machine with a continuous machine-wide backing belt running over a guide roll arranged in the press section and over at least a first drying cylinder of the drying section, and with a rope carrier arranged in the drying section on one side of the paper machine and outside the paper web width for threading a transfer strip through the drying section, characterized in that in the area of the transfer strip between the guide roll and the first drying cylinder there is a mechanical guide means provided for temporarily carrying the transfer strip separated from the backing belt, and the entrance point of the rope carrier is arranged before or in a paper looping zone of the first drying cylinder.

4,677,764
APPAREL DRYING TRAY

Gene L. Cerny, 3850 SW. Gamwell Rd., Topeka, Kans. 66610

Filed Feb. 11, 1985, Ser. No. 700,133
Int. Cl.[4] F26B *9/10*
U.S. Cl. 34—155 2 Claims

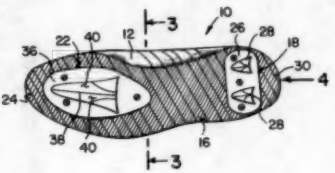


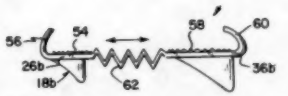
1. A device for drying articles of clothing comprising:
a low profile rigid frame of substantially lesser height dimension than width and length dimensions and divided into a larger section having an open top and a laterally adjacent smaller section with an interface between said larger section and smaller section; a plenum positioned along said smaller section and laterally adjacent to the larger section, discharging along a majority of the interface and being adapted to direct air flow into the laterally adjacent larger section in a direction parallel to the plane of the open top of said larger section; a water permeable horizontal rigid grill covering said open top of said larger section for direct placement thereon of said articles of clothing; a drip tray horizontally positioned under and coplanar with said grill for catching water that passes through said grill; louvers opening through said frame into said plenum; a fan attached to said frame within said plenum adapted for drawing air through said louvers and over said plurality of heating elements and discharging said air from said plenum along a plane parallel to the grill and from an edge of the grill directly adjacent said plenum.

4,677,765
BEACHRUNNERS

Carl Lubet, 439 Lafayette St., New York, N.Y. 10003, and George Spector, 233 Broadway Rm. 3615, New York, N.Y. 10007

Filed Feb. 28, 1986, Ser. No. 834,365
Int. Cl.[4] A43B *03/00, 05/00*
U.S. Cl. 36—1.5 2 Claims





1. A running shoe for running along a shore line on a beach which comprises:
(a) a waterproof upper having a removable spat;
(b) a deep scored sole secured to said upper;
(c) a heel cleat structure attached transversely across heel portion of said sole; and
(d) a toe cleat structure attached in alignment to toe portion of said sole so as to give increased traction and stability to said shoe, wherein said heel cleat structure comprises:
(e) a flange having a pair of spaced apart downwardly extending cleats molded thereto; and
(f) a pair of stiffeners, each having a top lip member and a vertical member placed within one of said cleats wherein said toe cleat structure comprises:
(g) a flange having a downwardly extending cleat molded thereto, said cleat having a curvature to prevent sand buildup thereon; and
(h) a stiffener having a top lip member and a vertical member placed within said cleat, wherein said toe cleat structure further comprising:
(i) said flange in the toe area having a deep scored upper surface; and
(j) hook and loop pile fastener straps affixed to opposite sides of said flange in which said deep scored upper surface of said flange can bear against said deep scored sole with said straps secured over said upper so that said toe cleat structure can be easily secured and removed therefrom.

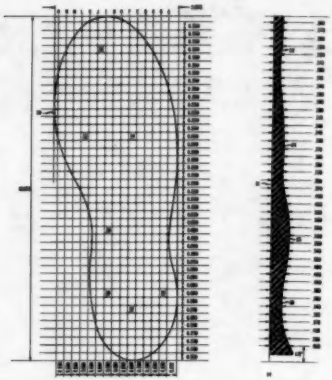
4,677,766
SHOE INLAY

Charles J. Gudas, Lockport, Ill., assignor to Scholl, Inc., Memphis, Tenn.

Filed Jul. 28, 1982, Ser. No. 402,652
Int. Cl.[4] A43B *13/38*
U.S. Cl. 36—43 6 Claims

1. A shaped, resilient full shoe inlay for athletic footwear comprising:
(a) a bottom surface,
(b) a contoured top surface to support a foot having:
(1) a depression for the first metatarsal head,
(2) a raised portion for the second, third, fourth and fifth metatarsal heads,

(3) a support for the medial longitudinal arch, said support being higher than said raised portion continuously curving downward from the inside of the arch toward the outside of the arch and being completely filled with resilient material from said bottom surface to the top of said support, and



(4) a concave seat for receiving the heel, said seat being eccentric about the inlay's longitudinal axis such that said seat it built up higher on the inside of the heel than on the outside of the heel,

wherein said inlay has dimensions in accordance with or proportional to those of FIGS. **1** through **16**.

4,677,767

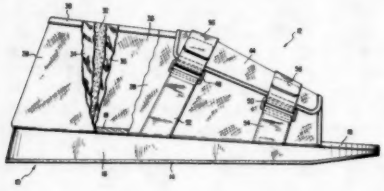
SHOCK ABSORBING SURGICAL SHOE

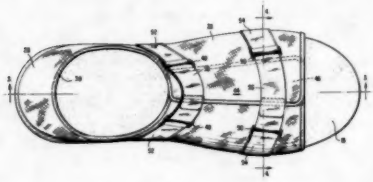
H. Darrell Darby, 1038 Sixth Ave., Huntington, W. Va. 25701

Continuation-in-part of Ser. No. 640,392, Aug. 13, 1984, abandoned. This application Apr. 11, 1986, Ser. No. 850,832

Int. Cl.[4] A43B *11/00, 13/18*

U.S. Cl. 36—102 **5 Claims**





1. A surgical shoe adapted for use on a post-operative or otherwise traumatized foot comprising:

a sole assembly including an inner sole conforming generally to the plantar aspect of the foot, a midsole of an impact absorbing material, said midsole having its greatest thickness in the heel region and tapering downwardly toward the toe region, and an outer sole, said sole assembly having a degree of flexibility similar to that of a conventional running shoe sole assembly; and

an upper assembly secured to said sole assembly and adapted to surround the heel, sides and dorsal portions of the foot while leaving the toe region open, the heel region of said upper assembly being angled forwardly and upwardly from the sole assembly, the forward portions of said upper assembly being divided into left and right flaps one of which is of greater length than the other, is adapted to cover the dorsal region of the foot, and underly said other of said flaps, and strap means for interconnecting the outerface portions of said left and right flaps.

4,677,768

REAR ENTRY SKI BOOT

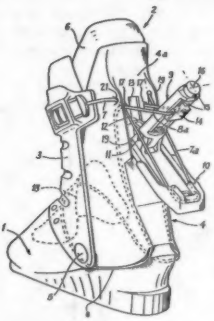
Louis Benoit, Frangy; Michel Mabboux, Seynod; Bernard Nerrinck, La Balme De Sillingy, and Jean-Louis De Marchi, Duingt, all of France, assignors to Salomon S.A., Annecy, France

Continuation-in-part of Ser. No. 700,302, Feb. 11, 1983. This application Feb. 7, 1986, Ser. No. 827,007

Claims priority, application France, Feb. 10, 1984, 84 02900; May 18, 1984, 84 08598; Feb. 8, 1985, 85 01844

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—117 **32 Claims**



1. A ski boot for holding the lower leg and the foot of the skier therein, wherein said ski boot comprises:

(a) means for tightening said boot on the lower leg of the skier;

(b) means for holding the foot of the skier down in said boot;

(c) first means for actuating said tightening means to tighten said boot on the lower leg of the skier; and

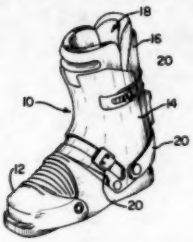
(d) second means for actuating said holding means to hold down the foot of the skier in said boot, wherein said first and second actuating means comprise separate levers, wherein said boot further comprises a shell base, and an upper surrounding the lower leg of the skier comprising at least one posterior portion, wherein said first and second actuating means comprise two independent manipulation levers, one of which is positioned above the other, and both of which are journalled on said at least one posterior portion of said upper around an axis transverse to the longitudinal axis of said boot, wherein said tightening means is connected to one of said manipulation levers, wherein said holding means is connected to the other of said manipulation levers.

4,677,769

FOOTWEAR WITH PIVOTAL TOE

Eddress Ahmad, Box 1725, Avon, Colo. 81620, and Roger N. Pack, Box 841, Edward, Colo. 81632

Filed Feb. 28, 1986, Ser. No. 835,038
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—117 30 Claims



1. An article of footwear adapted to receive the human foot and operative to prevent torsional rotation of the foot while permitting bending movement about the ball of the foot, comprising:

a toe portion having a first sole portion and a first relatively rigid upper shell, said first sole portion and said first upper shell configured to extend around and enclose a forward part of the human foot from a forward tip receiving the toes rearwardly to a location just behind the ball of the foot, said shell having a rear edge extending over the ball of the foot;

a heel portion having a second sole portion formed independently of said first sole portion and a second relatively rigid upper shell, said second upper shell having an access opening to permit insertion and removal of the foot, said second upper shell extending around the rear of the foot and forwardly to a location proximate the ball of the foot and forwardly to a location proximate the ball of the foot and having a forward edge extending over the foot, said second upper shell and said second sole portion enclosing a rearward part of the foot; and

hinge means interconnecting said toe portion and said heel portion for relative rotational motion about a fixed rotational axis in an axis plane substantially parallel to the plane of the first sole portion between a flat position wherein the respective first and second planes of said first and second sole portion are substantially parallel and a flexed position wherein said first and second planes are at an angle with respect to one another, said forward edge and said rear edge defining a wedge-shaped cut out region between said first and second upper shell when in the flat position, said hinge means pivotal about a single axis whereby said toe portion and said heel portion are fixedly interconnected in a manner substantially prohibiting torsional movement therebetween.

4,677,770

ALPINE SKI BOOT

Jean-Louis De Marchi, Duingt; Michel Mabboux, Seynod; Jean Paris, Sevrier, and Norbert Kopp, Chavanod, all of France, assignors to Salomon S.A., Annecy, France

Filed Dec. 20, 1985, Ser. No. 811,451
Claims priority, application France, Dec. 20, 1984, 84 20161
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—120 47 Claims

1. A ski boot comprising:

(a) shell base comprising an abutment; and

(b) an upper mounted on said shell base and adapted to hold the lower leg of a skier, wherein a part of said upper engages said abutment at least in response to rearward pressure from the lower leg of the skier on said upper, wherein said upper further comprises a front portion and a rear portion, wherein said shell base further comprises a heel portion and two lateral sides, wherein said front portion of said upper comprises two lateral extensions, each extending rearwardly along a different lateral side of said shell base to said heel portion of said shell base,

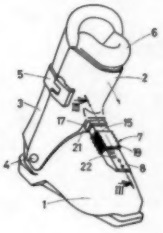
wherein said upper further comprises an element attached to said extensions, wherein at least one member of the following group engages said abutment at least in response to rearward pressure from the lower leg of the skier on said upper: said extensions and said element.

4,677,771

SKI BOOT

Simon Arieh, Geneva, and Guy Courvoisier, Celigny, both of Switzerland, assignors to Lange International S.A., Fribourg, Switzerland

Filed Jun. 10, 1986, Ser. No. 872,707
Claims priority, application Switzerland, Jun. 24, 1985, 2674/85; Mar. 4, 1986, 884/86
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—120 12 Claims



1. A ski boot which is made of at least semi-rigid material and which consists of a shell (1; 31; 61) incorporating the sole and surrounding the foot and the heel and of an upper (2, 3; 32; 62) articulated on the shell about a transverse pivot pin (4; 64), an elastic device being arranged between the upper and the shell so as to offer elastic resistance to the forward inclination of the upper, wherein the elastic device comprises an element made of incompressible elastic material that can be deformed by expanding (15; 40; 75) and adjustable means (19; 38; 73) of limiting the length of the part of the elastic element capable of being deformed by expanding.

4,677,772

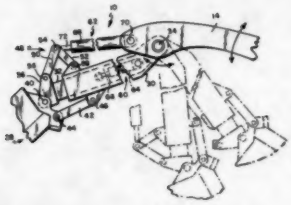
EXCAVATOR WITH EXTENSIBLE BOOM

Aldo Morelli, 25 Rockwood Ter., Jamaica Plain, Mass. 02130

Filed Jan. 9, 1986, Ser. No. 798,983
Int. Cl.[4] E02F 5/02
U.S. Cl. 37—103 8 Claims

1. An excavator comprising a boom pivotally supported at its proximal end to the platform of a supporting chassis for movement of the boom about a horizontal axis, an excavator, first means supporting the excavator adjacent the distal end of the boom for rectilinear and pivotal movement thereof relative to the distal end of the boom, said first means comprising a first

rigid arm pivotally connected at one end to the distal end of the boom for pivotal movement about a horizontal axis spaced from the distal end of the boom and a rigid second arm mounted to the distal end of the first arm for rectilinear movement relative thereto, first power-operable means operable to effect rectilinear movement of the excavator relative to said



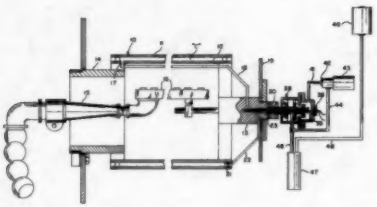
first means and second power-operable means operable to effect pivotal movement of the excavator relative to said first means and articulated links pivotally connected at their distal ends to, respectively, the distal end of the first rigid arm and the distal end of the second rigid arm and means pivotally connecting the second power-operable means to the distal end of the boom and to the articulation connecting the links.

4,677,773

HEATED ROTARY FLATWORK IRONER

Eduard Kamberg, Chicago, Ill., assignor to New Super Laundry Machinery Co. Inc., Ill.

Filed Dec. 20, 1985, Ser. No. 811,356
Int. Cl.[4] D06F *67/02*
U.S. Cl. 38—44 **8 Claims**



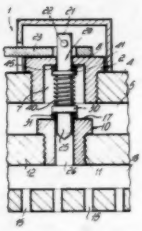
1. A heated rotary flatwork finisher comprising:
(a) a drum having a double wall construction providing a closed annular fluid cavity,
(b) means supporting said drum for rotation about its horizontal axis,
(c) a fluid inlet port for said cavity at the remote end of said drum and a fluid exhaust port for said cavity at the opposite end of said drum,
(d) a stationary ignitable heat source within said drum for heating the fluid in said cavity so as to provide an optimum heat transfer to the outer wall of the double walled drum,
(e) a fluid flow system including said inlet and exhaust ports and means having communication through said supporting means for recirculating the fluid into said fluid cavity through said inlet port at the remote end of said drum and out of said cavity through said exhaust port,
(f) means exteriorly of said drum and in a portion of said fluid flow system and in the path of the recirculating fluid for sensing the temperature of such recirculating fluid and responsive to a predetermined temperature thereof for controlling the simultaneous ignition of said heat source and said means for recirculating the fluid through said fluid cavity, and
(g) means for sensing the presence of fluid in said fluid flow systems.

4,677,774

VALVE ASSEMBLY STRUCTURE FOR STEAM FLATIRONS

Ercole Macchi, Via G. Agnesi, 5-Milano, Italy

Filed Nov. 18, 1985, Ser. No. 799,533
Claims priority, application Italy, Nov. 22, 1984, 23859/84[U]
Int. Cl.[4] F16K *1/46;* **D06F** *75/06, 75/20*
U.S. Cl. 38—77.83 **10 Claims**



6. A steam flatiron having an upper delimiting wall and a bottom wall connected to each other and defining therebetween a flatiron inside cavity with a main steam chamber and a steam delivery chamber, said flatiron further having an intermediate wall extending in said flatiron inside cavity between said upper delimiting wall and said bottom wall and separating therein a main steam chamber from a delivery steam chamber facing said bottom wall, said main steam chamber having steam inlet means, said bottom wall defining a plurality of steam delivery holes communicating said steam delivery chamber with the outside, said upper delimiting wall having a first threaded aperture extending therethrough providing communication between said main steam chamber and the outside, said intermediate wall having a second threaded aperture extending therethrough between said main steam chamber and said steam delivery chamber in alignment with said first threaded aperture, a valve assembly including: a first ring nut having an outwardly threaded portion in tight screw thread engagement with said first threaded aperture and a first enlarged portion abutting against said delimiting wall at the flatiron outside, said threaded portion defining an axial cavity having a cavity ceiling with a first through-hole extending in said first enlarged portion, a second ring nut having an outwardly threaded portion in tight screw thread engagement with said second threaded aperture and a second enlarged portion abutting against said intermediate wall in said main steam chamber and extending at a distance from said first ring nut, said second ring nut defining a second through-hole extending axially in said second ring nut and being axially aligned with said first through-hole, a valve stem extending through said first threaded aperture, said axial cavity and said main steam chamber and having a tip at least partially extending in said second through-hole, and a head tang protruding from said first threaded aperture toward the flatiron outside, said valve stem defining near said tip an annular flange boss and at said head tang an actuation cross-pin, a washer extending around said valve stem between said cavity ceiling and said flange boss, a first annular seal extending around said valve stem between said washer and said cavity ceiling a second annular seal extending around said valve stem between said boss flange and said second ring nut, and a spring means extending around said valve stem between said washer and said flange boss and pushing said washer and said first annular seal against said cavity ceiling and said flange boss and said second

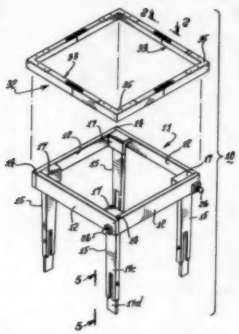
annular seal against said second enlarged portion of said second ring nut.

4,677,775

UNIVERSALLY ADJUSTABLE QUILTING FRAME

Beatrice W. Riley, 30 Woodland La., Arcadia, Calif. 91006

Filed Jun. 13, 1986, Ser. No. 873,965
Int. Cl.[4] D06C *3/08*
U.S. Cl. 38—102.2 **9 Claims**



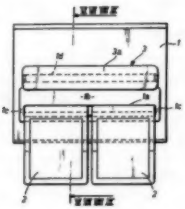
1. In a quilting frame assembly, the combination comprising:
(a) a first rectangular frame extending generally horizontally, and legs supporting said first frame to receive a quilt thereover to drape downwardly adjacent the frame sides,
(b) and a second rectangular frame having four elongated members, at least two of said elongated members comprising sections which are relatively movable lengthwise of the members to vary the overall lengths of said members,
(c) whereby the second frame is adjustable in size to fit closely about the quilt at the level of the first frame, to firmly position the quilt on the first frame,
(d) pairs of said members being rigidly joined together at their ends to form four L-shaped corners of the second frame.

4,677,776

DEVICE FOR MARKING PRESENCE, RESERVATION OR INFORMATION

Jean-Pierre R. Lanier, Hameau de Margerie, 26230 - Colonzelle, and Georges P. Marie, Chemin du Moulin, Richerenches - 84600 - Valreas, both of France

Filed Jul. 9, 1985, Ser. No. 753,274
Claims priority, application France, Jul. 13, 1984, 84 11268
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—15 R **14 Claims**



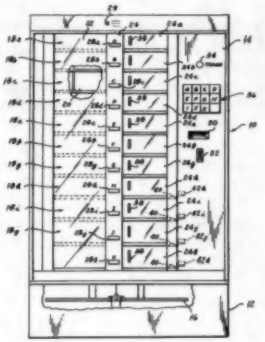
1. A device for marking presence, reservation or information by means of at least one badge engaged in a case, comprising:
a plurality of juxtaposed flexible blades and fixed blades presented opposite a front wall of the case, of which the flexible blades are mounted in elastic manner in the case and cooperate with the badge to lock it on said case;
a badge comprising cavities on one of its faces, which cavities are juxtaposed and correspond to said blades, certain of these cavities cooperating with free ends of said flexible blades;
at least one other flexible blade substantially parallel to said blades and mounted in elastic manner in the case and comprising at least one configuration on at least one of its side edges; and
a key engaged frontally in the case and cooperating with said flexible blades, which key comprises on its front edge a plurality of notches determining projections to abut on the flexible blades and further comprises at least one lateral notch adapted to latch on said configured flexible blade to lock the key on said blade in the absence of a badge on the case, so that the badge, in locked position, exerts a pressure on said configured blade to displace the configuration and to allow the withdrawal of the key and so that the complete engagement of the key in the case, by displacement of the flexible blades, causes the ends of the blades to leave said cavities of the badge, to allow said badge to be withdrawn.

4,677,777

PRICE SETTING AND DISPLAY SYSTEM FOR MULTIPLE UNIT MERCHANDISING MACHINE

David Hoffman, Hillsdale, N.J.; Lee C. Verduin, and Ross Ouwinga, both of Grand Rapids, Mich., assignors to Rowe International, Inc., Whippany, N.J.

Filed May 8, 1985, Ser. No. 731,967
Int. Cl.[4] G09F *19/04*
U.S. Cl. 40—460 **10 Claims**



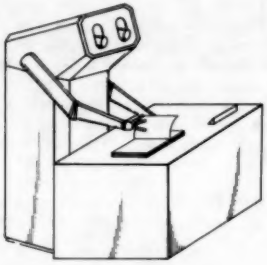
1. A price setting and display system for a mechandising machine adapted to sell articles of merchandise from a plurality of dispensing units at various prices, said units being disposed at spaced locations in a cabinet having a door, said cabinet with said door closed affording a view of said units while preventing access thereto, said system including a plurality of individual displays, means mounting said displays on said machine at respective positions adjacent to said locations and visiable to a potential customer with the door closed, normally disabled means at a central location within said cabinet for setting prices for said units and for actuating said displays in accordance with prices at which articles are to be sold and means responsive to opening of said cabinet door for concomitantly disabling said units and enabling said normally disabled means.

4,677,778

SHEET MANIPULATING APPARATUS

Kanehiro Sorimachi, and Makoto Tamari, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 566,547, Dec. 29, 1983, abandoned. This application Oct. 20, 1986, Ser. No. 920,942
Claims priority, application Japan, Jan. 7, 1983, 58-973
Int. Cl.[4] G09F *11/00*
U.S. Cl. 40—476 **4 Claims**



1. A working apparatus for manipulating a sheet comprising:
arm means having a plurality of finger means disposed at an end of said arm means for contacting a sheet;
a plurality of roller means provided on said finger means;
sensor means provided on at least one of said finger means for detecting a condition of the sheet; and
control means responsive to the output of said sensor means for controlling the force of said roller means against the sheet, said control means being adapted to provide at least one of rotational and translational movement of said roller means to pick up one sheet from a layer of sheets between said roller means,
wherein said control means (i) positions two of said roller means, apart from each other by a predetermined distance, on a portion of a top sheet on the layer, (ii) effects rotational movement, and translational movement toward one of said roller means such that the other of said two roller means is positioned at an opposite side of the top sheet from which said one roller means is positioned, (iii) causes said one and said other roller means to be rotated in opposite directions such that only the top sheet is picked up between said two roller means, and (iv) effects the translational movement of said arm means and finger means such that only the top sheet of the layer is picked up and turned without moving the remaining sheets.

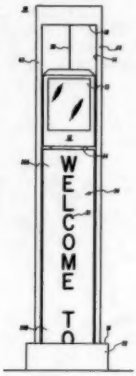
4,677,779

ELEVATOR DISPLAY SYSTEM

Anthony R. Rodriguez, 3847 Timberglen, Apt. 4212, Dallas, Tex. 75252

Filed Feb. 10, 1986, Ser. No. 831,003
Int. Cl.[4] G09F *11/18*
U.S. Cl. 40—514 **14 Claims**

1. A display system comprising, in combination:
an elevator cab moveable between vertically spaced apart first and second positions; and
means cooperating with said elevator cab for providing a visual display between said elevator cab and at least one of said first and second positions, said display being changeable in accordance with the movement of the elevator cab between said first and second positions.

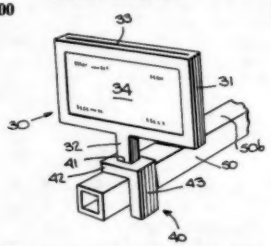


4,677,780

MAGNETICALLY SECURED DISPLAY APPARATUS

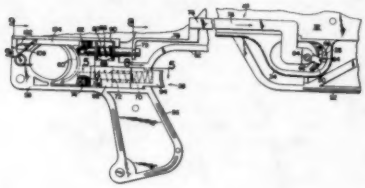
Bernard E. Shuman, Merrick, N.Y., assignor to EEE Corporation, Port Washington, N.Y.

Filed Nov. 18, 1985, Ser. No. 798,954
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—600 **11 Claims**



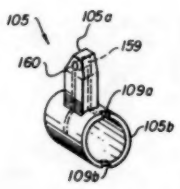
1. A sign holder for securing a vertical planar sign on a magnetically attractable support rod of a clothing rack, or the like, comprising:
a frame member for holding the sign; and
clamp means for connecting said frame member to said rod, said clamp means including,
(i) an L-shaped tubular housing having a first leg portion and a transverse second leg portion extending from one end of said first leg portion,
(ii) permanent magnet means integrally connected to said first leg portion for detachably magnetically clamping said first leg portion to a vertical surface of the rod, with said second leg portion overlying and supported on an upper horizontal surface of the rod, and
(iii) connecting means for detachably connecting said frame member to said transverse second leg portion for supporting said frame member and the sign held therein in a substantially vertical plane when said first leg portion is magnetically attached to said vertical surface of said rod,
whereby the weight of the frame member and the sign held therein passes through said second leg portion to, and is borne entirely by, the rod, said magnet means serving only to resist displacement of the sign holder.

4,677,781
RETROFIT FIREARM
Joseph L. Lee, Woodbridge, Conn., assignor to Mossberg & Sons, Inc., North Haven, Conn.
Filed Mar. 11, 1986, Ser. No. 838,623
Int. Cl.[4] F41C *17/08, 7/00*
U.S. Cl. 42—70.01 20 Claims



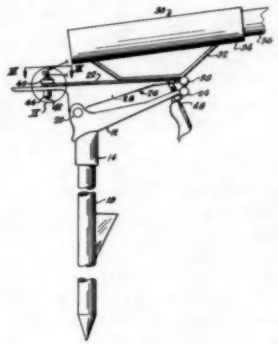
15. A retrofit firearm having a receiver, a firing mechanism contained within said receiver, a secondary trigger supported on the receiver to move between ready and firing positions for releasing said firing mechanism in said firing position to discharge said firearm, a retrofit housing containing at least a portion of said receiver, a primary trigger supported on said retrofit housing in spaced relation to said secondary trigger for movement between first and second positions corresponding respectively to said ready and firing positions, operating means for moving said secondary trigger to said firing position in response to movement of said primary trigger toward said second position, and a first safety mechanism associated with said secondary trigger including a first blocking member supported for movement between blocking and releasing positions, means for biasing said first blocking member toward said blocking position, said first blocking member in said blocking position preventing movement of said secondary trigger to said firing position, and releasing means for moving said first blocking member from said blocking position to said releasing position in response to movement of said primary trigger toward its second position.

4,677,782
POSITION ACTUATED ILLUMINATED GUNSIGHT
Gordon E. Kaye, Garrison, and Joseph A. Agnello, Jr., Peekskill, both of N.Y., assignors to Univention Inc., Garrison, N.Y., a part interest
Continuation-in-part of Ser. No. 451,476, Dec. 20, 1982, Pat. No. 4,524,534. This application Jun. 21, 1985, Ser. No. 747,354
Int. Cl.[4] F41G *1/32*
U.S. Cl. 42—100 12 Claims



12. An illuminated gunsight for a firearm, having existing sighting means, comprising a base member, affixed to said sighting means by an anchoring clamp member, and an illumination member having illumination means contained therein, said illumination member having a tubular section thereof rotatably affixed to a battery fixedly anchored to said base member, said battery being contained within an insulative casing therefor, wherein said illumination means is electrically connected to an end terminal of said battery and wherein a conductive member is affixed to said illumination means, with said conductive member being in contact with another terminal of said battery when said illumination means is in alignment with said existing sighting means thereby activating said illumination means and wherein an insulation member is positioned between said conductive member and said battery when said illumination means is out of alignment with said existing sighting means thereby deactivating said illumination means.

4,677,783
FISHING ROD TENDER WITH AUTOMATIC FISH HOOK SETTING FEATURE
Steve N. Cratsa, 550 Foltz Dr., Verona, Pa. 15147
Filed Aug. 19, 1986, Ser. No. 898,244
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—15 3 Claims



1. A device for automatically setting a fish hook comprising:
(a) a vertical support element;
(b) a lower plate element superimposed on said vertical support element and extending outwardly therefrom to a terminal end;
(c) an upper plate element mounted to the lower plate element to be pivotable through a vertical arc;
(d) a latch element mounted on the upper plate element to be pivotable in a generally horizontal arc;
(e) a rod element mounted at the terminal end of the lower plate element to be pivotable in a vertical arc and to be extendable rearwardly to be engaged with the latch element;
(f) an expandable compression spring element positioned between the upper and lower plate elements; and
(g) a fishing rod holding pipe element superimposed on the upper plate member such that fishing line may be wrapped around the latch element so that tension on said line will pivot the latch element out of engagement with the rod element to relieve restraint on the spring element and allow the upper plate element to be upwardly displaced in a vertical away from the lower plate element.

4,677,784
FISHING ROD HOLDER AND ALARM
Joseph S. Butkus, 1512 S. Indian Pl., North Brunswick, N.J. 08902
Filed Mar. 21, 1986, Ser. No. 842,273
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—16 7 Claims

1. A fishing rod holder comprising
a tubular member having a pointed lower end which can be forced into the ground, said tubular member having a plurality of holes along its length,
a ring slidably mounted on said tubular member,

means associated with said ring for releasably securing said ring at selected positions along said tubular member by engaging a selected one of said holes, and

means within said ring for supporting the end of a fishing rod inside said tubular member.

4,677,785

AERATED LIVE BAIT BUCKET

Robert G. Lambourn, 3412 W. Fairway Dr., McHenry, Ill. 60050

Filed Oct. 28, 1985, Ser. No. 792,048
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 **17 Claims**

1. An aerated live bait bucket comprising:
a. a bucket for holding water having a bottom with an aperture formed therein, and sidewalls,
b. a base extension formed below said bottom and with said bottom forming a cavity,
c. an air pump mounted in said cavity,
d. a check valve,
e. means connecting the output of said air pump through said check valve to said aperture, whereby air pumped by said air pump is introduced into the water in said bucket through said check valve and aperture, said check valve preventing the backflow of water from said bucket through said aperture into said air pump,
f. a battery holder for holding batteries which supply energy to said pump,
g. an electric switch for control of the operation of the pump, and
h. a base plate is provided which substantially encloses said cavity, wherein said air pump, said battery holder and said switch are all mounted on the base plate thus facilitating construction of the aerated live bait bucket

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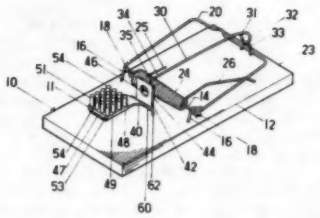
4,677,786

SMALL ANIMAL TRAP WITH MULTIFINGERED BAIT HOLDER

Marc Frank, 1699 Koshkonong, Stoughton, Wis. 53589

Filed Jun. 13, 1986, Ser. No. 873,796
Int. Cl.[4] A01M *23/30*
U.S. Cl. 43—82 **15 Claims**



1. A small animal trap comprising:
(a) a base;
(b) biased jaw means pivotally mounted on the base for snapping from an open position to a closed position to trap the animal;
(c) latching means for latching the jaw means in its open position when the trap is set and releasing the jaw means to close in response to a trigger actuation movement;
(d) touch-sensitive trigger means for responding to small physical movement and vibrations to move the latching means so that the latching means releases the jaw means to close; and
(e) a bait holder mounted to the touch-sensitive trigger means, the bait holder having a flat base with a top surface and a multitude of closely spaced fingers extending upwardly from the top surface to hold bait in the interstices between the fingers, wherein the fingers are arranged in parallel rows in one direction and in parallel columns perpendicular to said one direction.

4,677,787

APPARATUS FOR MOUNTING APPLICATION HEADS TO AN AGRICULTURAL IMPLEMENT

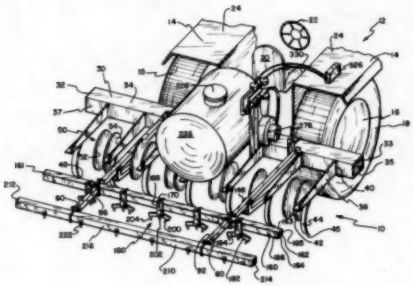
Ronald S. Said, 3223 E. 100 S., Hartford City, Ind. 47348

Filed Oct. 15, 1984, Ser. No. 661,108
Int. Cl.[4] A01G *13/00*
U.S. Cl. 47—1.5 **9 Claims**

1. An apparatus for mounting a plurality of fluid spray heads to an agricultural implement pulled by a tractor and used in row crop farming wherein the implement includes a frame having a generally transversely disposed frame support member and a plurality of row crop working devices mounted to the frame support member, the apparatus comprising:
a mounting fixture mounted at one end thereof to the frame support member, the other end of said mounting fixture extending rearwardly of the implement so as to be positioned to the rear of the row crop working devices;
an elongate mount support attached to said mounting fixture adjacent the other end thereof and positioned rearwardly of the row crop working devices, said mount support disposed generally transversely to the longitudinal direc-

tion of the row crops, said mount support receivable of the fluid spray heads in a spaced-apart fashion along the length of said mount support whereby the spray heads and row crop working devices cooperate to perform a farming operation on the row crop; and

said mounting fixture further including height adjustment means for selecting the vertical position of all the spray heads relative to the row crop, said mounting fixture including a bracket directly connected to said elongate mount support, an elongate arm pivotally mounted at one end to said bracket, a pair of outer and inner telescoping members each having a distal end, said outer member pivotally mounted at said distal end thereof to said



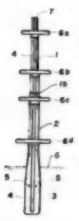
bracket, said inner member pivotally mounted at said distal end thereof to said arm, and said outer and inner members each having a connected end at which they are telescopically connected so that the relative positioning between the inner and outer members determines the vertical distance between the spray heads and the row crops, said bracket including a plurality of spaced-apart vertically disposed apertures, and said elongate arm containing an aperture adjacent said one end thereof, said elongate arm being positionable to any one of a plurality of positions corresponding to said arm aperture being aligned with a selected one of each of said bracket apertures.

4,677,788

SUPPORT FOR TOMATO PLANTS AND THE LIKE

Frank Mastandrea, 300 Hamilton Rd., Pittsburgh, Pa. 15234

Filed Oct. 28, 1985, Ser. No. 792,281
Int. Cl.[4] A01G *17/06*
U.S. Cl. 47—47 **6 Claims**



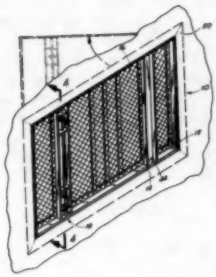
1. A support for tomato and other plants, comprising an elongated bottle-like plastic container having a top portion which is progressively increased in diameter in a downward direction and having an enclosed base portion of maximum diameter adapted to be inserted in the ground and which base portion has perforations at a height which determines the height of a constant reservoir of water always retained for watering and for stability, the top portion of said base portion being frusto-conical, a plurality of wheel-like elements of different internal diameter removably supported and slidably fitted on said top portion in vertically spaced relationship.

4,677,789

WINDOW BAR ASSEMBLY

Mark A. Merry, 190 Johnson La., Tickfaw, La. 70466

Filed Feb. 3, 1986, Ser. No. 825,258
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—56 **17 Claims**



1. A window guard assembly comprising:

a. a first stationary rectangular frame adapted to be rigidly secured within a window opening;

b. a second rectangular frame hingedly attached to said first frame and movable between a first closed position within said first frame and a second open position;

c. a closure grating rigidly attached to said second frame, thereby preventing manual access therethrough; and

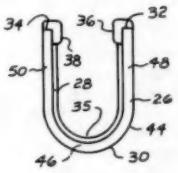
d. means for releasably locking said second frame in said first closed position, said locking means being movable between a first locking position whereby said locking means is in engagement with said first and second frames and a second release position whereby said means is disengaged from said first and second frames, said locking means being housed in a channel member rigidly attached to said second frame and closure grating, said channel member extending vertically within said second frame between the top and bottom thereof and being open only opposite said closure grating to thereby provide access to said locking means from inside said window.

4,677,790

DOOR EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Mar. 4, 1986, Ser. No. 835,917
The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.
Int. Cl.[4] E05F *7/00*
U.S. Cl. 49—462 **14 Claims**



1. In combination with the trailing edge of a swinging closure, a self-retaining insulating metal edge guard fitted onto

said trailing edge comprises an elongate metal channel having in transverse view inner and outer legs extending from a generally semi-circular base, said inner and outer legs serving to apply self-retention forces to opposite sides of said trailing edge, said channel being formed from a metal strip of uniform thickness having side edge surfaces which become distal end edge surfaces of the legs in the channel, non-metallic insulating material disposed on the metal channel in covering relation to said legs and base including a covering relation wherein direct contact of the metal of the channel with said trailing edge is prevented by said non-metallic insulating material, said non-metallic insulating material having respective zones, one of said zones being on one leg at the location of force application by that leg to said trailing edge, another of said zones being on the other leg at the location of that other leg's force application to the trailing edge, and a further of said zones disposed on the channel between said one and said another zones wherein said one and said another zones are of harder non-metallic insulating material than said further zone of non-metallic insulating material.

4,677,791

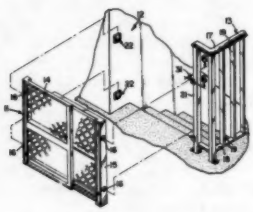
ADJUSTABLE GATE FOR DOORWAYS

Donald A. Larson, Circle Pines, and Peter M. Runyon, St. Paul, both of Minn., assignors to North States Industries, Inc., Minneapolis, Minn.

Filed Jun. 13, 1986, Ser. No. 873,994

Int. Cl.[4] E06B *3/32*

U.S. Cl. 49—463 **19 Claims**



1. In combination:

a portable security gate for doorways and the like, comprising relatively movable portions at least one of which has a side member with at least one projecting bumper formed from frictional material and of predetermined configuration, the security gate further comprising means for effective relative movement between said portions to vary the effective width of the gate and for urging the movable portions relatively apart to cause the frictional bumper to forceably engage a doorway defining member;

and a mounting socket comprising a base member having front and rear faces, the rear face being constructed to conform to said doorway defining member, and including means for adhesively securing the mounting socket to a doorway defining member in a postion to receive the frictional bumper, and the front face having means projecting forwardly therefrom to define a socket sized and configured to retainably receive the frictional bumper.

4,677,792

CLAMPING OR CHUCKING SYSTEM FOR A GRINDING WHEEL OR DISK

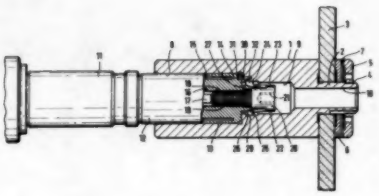
Hans Speidel, Nürtingen, Fed. Rep. of Germany, assignor to Montanwerke Walter GmbH, Tübingen, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,866

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512366

Int. Cl.[4] B24B *41/04*

U.S. Cl. 51—168 **20 Claims**



1. Chucking or clamping system for connecting a grinding wheel or disk (**3**) to a drive spindle (**11**) having

a disk holding bushing (**1**) formed with an end surface for engagement with the grinding disk (**3**) at one end of the bushing and further formed with means coaxial with the grinding disk, for selectively releasably coupling the bushing (**1**) to the spindle (**11**),

wherein said releasable coupling means comprises

a coaxial cylindrical bore (**8**) formed in the holding bushing (**1**);

a hydraulic expansion system formed on one end portion of the spindle (**11, 12**) and located in the bore (**8**) of the holding bushing (**1**),

said hydraulic expansion system including

a radially expansible thin-walled expansion sleeve (**13**), a hydraulic pressure chamber (**15**) defined within said expansion sleeve for reception of a hydraulic pressure fluid, an axially movable fluid compression piston (**17**) extending into the pressure chamber, and

an axially movable engagement element (**18**) which is externally accessible and operatively coupled to the fluid piston,

said expansion sleeve, upon being subjected to hydraulic pressure, expanding to clamp the spindle (**11, 12**) coaxially in the bore (**8**) of the holding bushing (**1**);

and an interengaging axially latching safety locking means (**25–30**) coupled, respectively, to the spindle (**11, 12**) and the disk holding bushing (**1**), and movable to interengage and latch together said spindle and said bushing,

said engagement element (**18**) being operatively coupled to said interengaging safety locking means for, simultaneously, upon axial movement of said engagement element,

(a) interengagingly attaching the safety locking means (**25–30**) to latch together the spindle (**11, 12**) and the disk holding bushing (**11**); and

(b) applying, via said compression piston (**17**), hydraulic pressure on the pressure fluid in said chamber (**15**) to thereby coaxially clamp the holding bushing (**1**) and the spindle (**11, 12**) together.

4,677,793

METHOD AND APPARATUS FOR HIGH TOLERANCE POLISHING OF A WORKPIECE SURFACE

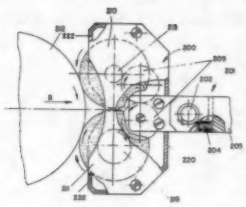
Itzchak Lapsker, Forest Hills, N.Y., assignor to GBI International Industries, Inc., W. Babylon, N.Y.

Continuation of Ser. No. 386,673, Jun. 8, 1982, Pat. No. 4,583,328, which is a continuation-in-part of Ser. No. 114,297, Jan. 22, 1980, Pat. No. 4,361,987, which is a continuation-in-part of Ser. No. 832,623, Sep. 12, 1977, abandoned. This application Jan. 28, 1986, Ser. No. 823,248

Claims priority, application Israel, Oct. 29, 1976, 50794

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—251 **5 Claims**



1. A finishing tool for finishing the radial surface of a workpiece rotating about a longitudinal axis thereof, comprising:

a first rotatable finishing element arranged for engagement with the moving surface of the rotating workpiece when the tool is in use, such that said first finishing element is driven by the workpiece when in engagement therewith;

a second rotatable finishing element arranged for engagement with the moving surface of the rotating workpiece when the tool is in use;

transmission means, connecting said first and second rotatable finishing elements, for transmitting the motion of said first finishing element, driven by the rotating surface of the workpiece, to said second finishing element such that said second finishing element turns in a direction against that in which it would otherwise be driven by the workpiece and at a surface speed which is slower than that of said first polishing element.

4,677,794

SUPPORT ASSEMBLY FOR A SHELF OR LIKE STRUCTURE

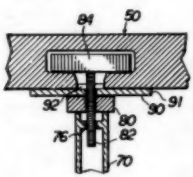
Ivan Parron, 133 W. 23rd St., Hialeah, Fla. 33010, and Michael R. Rosenthal, 6001 SW. 118 St., Miami, Fla. 33156

Continuation-in-part of Ser. No. 411,439, Aug. 25, 1982, Pat. No. 4,450,655. This application Jan. 16, 1984, Ser. No. 570,935

The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.

Int. Cl.[4] A47B *5/00*

U.S. Cl. 52—36 **14 Claims**



1. A support assembly of the type primarily designed for mounting within a panel slot having a predetermined configuration and an entrance, said support assembly comprising:

(a) a clamp assembly means for removable mounting within the panel slot and including a force distribution plate,

(b) a support bar secured to said force distribution plate and extending outwardly therefrom away from the panel slot,

(c) said clamp assembly means further including a first connector means movably mounted on said force distribution plate having second connector means threadably engaged therewith and a keeper bar means fixedly secured to an end of the first connector means so that said keeper bar means can be secured in clamping relation with the slot by rotating the second connector means,

(d) said keeper bar means attached to said connector means and movably disposable within the panel slot relative to said force distribution plate, said keeper bar means disposable substantially transverse to a longitudinal axis of the panel slot and having a length substantially greater than the entrance to the panel slot so that opposing ends of said keeper bar bite into said slot, and

(e) said connecting means selectively movable relative to said force distribution plate along with said keeper bar means and said keeper bar means cooperatively positionable with said force distribution plate into clamping relation about the entrance to the panel slot.

4,677,795

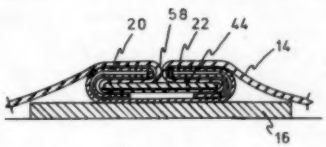
FASTENING DEVICE AND METHOD

Linden H. Mathews, 3366 E. Fair Pl., Littleton, Colo. 80121, and Douglas R. Crabb, 5642 W. Lakeridge Rd., Lakewood, Colo. 80227

Continuation-in-part of Ser. No. 532,675, Sep. 16, 1983, abandoned. This application Feb. 28, 1985, Ser. No. 706,722

Int. Cl.[4] E04B *7/14, 1/12, 1/347*

U.S. Cl. 52—63 **12 Claims**



1. A roof structure for a building having an exterior surface to be covered, comprising in combination:

at least one membrane composed of a flexible, water-repellant sheet, said sheet defining a roof covering applied over said exterior surface; and

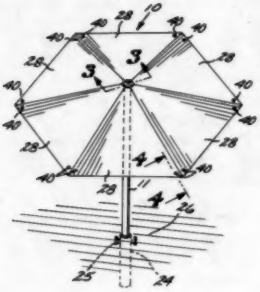
a plurality of fastening devices interposed at spaced intervals between said membrane and said exterior surface of said roof structure, each said fastening device including an elongated base member attached to said exterior surface and a pair of elongated, bendable arms extending upwardly from opposite sides of said base member, said arms being bendable about said base member between a first position defining a channel therebetween and a second position in which said arms extend inwardly with portions of said membrane covering free ends of said arms, and said arms extending parallel to said base member with said portions of said membrane touching one another a portion of said membrane disposed in each said channel to extend along inner facing surfaces of said arms and said base member when said arms are disposed in said first position, and said membrane portion fixed between said arms and said base member when said arms are bent into said second position.

4,677,796

SHELTER STRUCTURE

John A. Mellott, Indian Hills, P.O. Box 34B, Mountain Center, Calif. 92361

Continuation of Ser. No. 864,423, May 19, 1986, abandoned. This application Oct. 16, 1986, Ser. No. 919,508
Int. Cl.[4] E04B *1/34, 7/00;* **A45F** *1/00*
U.S. Cl. 52—73 **17 Claims**



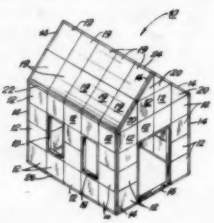
1. A shelter structure comprising:
a member extending in the vertical direction;
means associated with one end of said vertically extending member having a plurality of openings therein for receiving corresponding ends of a first set of a plurality of elongated members;
a plurality of fitting members, each of said fitting members having at least three portions associated therewith, the other ends of said first set of elongated members each being coupled to one portion in a corresponding fitting member;
a second set of plurality of elongated members, one end of each elongated member being coupled to another portion of one of said fitting members, the other end of said elongated member being coupled to another portion of a adjacent fitting member, the coupling of said second set of elongated members resulting in a connected, multi-edged side member; said side member and the connected first set of elongated members forming a series of inclined open sections; and
means for substantially enclosing each of said inclined open sections.

4,677,797

KNOCKDOWN HOUSING STRUCTURE

Herman Roth, 233 Keap St., Brooklyn, N.Y. 11211

Filed May 21, 1986, Ser. No. 865,414
Int. Cl.[4] E04B *7/02;* **E04C** *1/10, 1/30*
U.S. Cl. 52—94 **18 Claims**



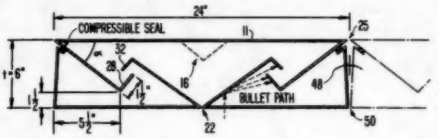
1. A knockdown housing structure comprising:
a plurality of wall panels;
coupling means for interconnecting said wall panels;
said coupling means including projecting members and elongated receiving slots;
said projecting members and slots being slidably engaged into a locking relationship;
said slots being provided along opposing outer edges of said panels;
said projecting members including projecting pins with enlarged heads; and
elongated connecting strips for interconnecting adjacent panels, said pins projecting from opposing sides of said strips and engaging said slots.

4,677,798

STEEL SHELL MODULES FOR PRISONER DETENTION FACILITIES

Edward H. Phillips, P.O. Box 979, Fort Collins, Colo. 80522

Filed Apr. 14, 1986, Ser. No. 852,021
Int. Cl.[4] E04H *3/08*
U.S. Cl. 52—106 **26 Claims**



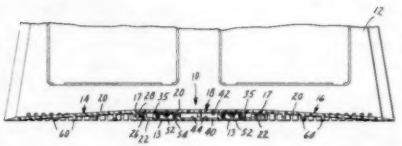
1. Building modules adapted to fit together for construction of fire, sound and impact resistant security barriers and rooms for use in securing records and persons, comprising in combination, an outer shell of substantially parallelepiped shaped with two outer steel plate panel sections of greater surface area serving as inner and outer walls for a structure when a plurality of the modules are fitted together, sealant means spacing the two panel sections from steel to steel contact with each other by a thermal-acoustical barrier material, and further means disposed inside the shell for increasing its load bearing capacity comprising internal steel baffles extending inwardly from the steel shell walls.

4,677,799

MULTI-SECTIONAL RACEWAY

Peter J. Zarembo, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 3, 1985, Ser. No. 804,041
Int. Cl.[4] E04B *5/48*
U.S. Cl. 52—220 **14 Claims**



1. A multi-sectional raceway for use in combination with a pair of detection system panels, interconnected by at least one support beam, to protect electrical wires and the like passing between the panels and to permit travel between the panels without materially affecting the operation of the system, comprising:
a generally rectangular central platform section having an upper surface, a lower surface, and a first end and a second end opposite said first end;
a first ramp section and a second ramp section, each of said ramp sections having an upper surface, a lower surface, and a raised end adapted to abut with one of said first or second ends;
interlocking means associated with said raised abutting ends of said ramp sections, and with said first end and said

second end of said central platform section for lockingly interconnecting said ramp sections and said central platform section to form a continuous upper surface; and

girder structure means running the width of said central platform section lower surface and having a substantially flat base for distributing loads applied thereto, and a plurality of arms extending from the base adapted to bear against and support a said platform section, at least one passageway being formed between said arms for permitting and protecting electrical wiring which may be positioned along said passageway to electrically connect the panels,

wherein said support beams interconnecting said detection panels have a predetermined cross-sectional configuration, and wherein said platform section, ramp sections and girder means are further dimensioned relative to said predetermined configurations to form in combination when assembled together at least one channel running along the lower surface of the platform section and between the outer edge of the girder means and the raised end of the ramp sections, within which may be accommodated in a non-engaging relationship at least one said support beam thereby isolating load forces associated with said travel upon said raceway between said panels from said panels to prevent wobbling of said panels.

4,677,800

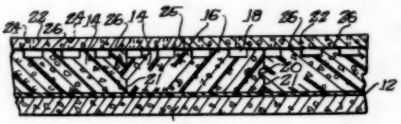
LIGHTWEIGHT ROOFING SYSTEM

David L. Roodvoets, Westerville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 10, 1984, Ser. No. 639,751

Int. Cl.[4] B32B *7/10;* **E04B** *1/80, 7/00*

U.S. Cl. 52—309.12 **5 Claims**



1. A roofing system comprising a roof deck, a waterproof membrane on said roof deck, a plurality of panels of foam plastic insulation on said waterproof membrane, said foam plastic insulation panels having a plurality of ribs having substantially flat tops lying in a common plane and spaced apart by grooves on the upper surface thereof, and a plurality of concrete panels overlying said raised areas, and means securing said concrete panels to said foam plastic insulation panels comprising adhesive on the flat tops of said ribs, each of said concrete panels having a plurality of holes therethrough disposed among the raised areas for ventilation of said foam plastic insulation panels, said holes being arranged in a plurality of rows within each concrete panel aligned with and overlying and communicating with said grooves, wherein said holes permit passage of water and air through each concrete panel into and out of the grooves of said insulating panels to provide ventilation by allowing moisture to escape from the panels and to provide wind resistance.

4,677,801

WALL, CEILING AND/OR FLOOR FORMATION AND A METHOD FOR PRODUCING IT

Martin Bard, Seminargasse 26, D-8450 Amberg, Fed. Rep. of Germany

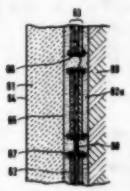
Filed Sep. 11, 1985, Ser. No. 774,919

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433702

Int. Cl.[4] E04B *2/02;* **H05B** *3/36*

U.S. Cl. 52—389 **6 Claims**

1. Means for heating a room having at least one surface forming a rigid substratum, a flat blanket-like heating element having inner and outer jackets of polyester and an electrical resistance member sandwiched between said jackets, means for connecting said resistance member to a source of electrical energy, at spaced intervals said resistance member having voids, a first layer of adhesive for bonding said inner jacket to said substratum; a layer of ceramic tiles forming the exterior



surface of said means, a second layer of adhesive between said tiles and an outer jacket of said heating element and bonded to both said outer jacket and the inner face of said tiles, at each of said voids in said resistance member a conection being formed between said first and second layers of adhesive capable transmitting from the tile to the substratum all of stress required to support said tile.

4,677,802

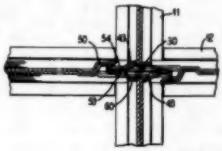
SUSPENDED CEILING SYSTEM AND RUNNER

Ronald W. Vukmanic, Naperville, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.

Filed Mar. 7, 1986, Ser. No. 837,370

Int. Cl.[4] E04B *5/52*

U.S. Cl. 52—488 **11 Claims**



1. A suspended ceiling system comprising main runners extending parallel to each other and cross-runners extending between the main runners at spaced intervals, each of said runners being composed of a first member and a cap member, said first member having an inverted T configuration with a pair of flange elements being connected by webs to an integral bead, each of the flange elements having a first flange portion being connected by an offset portion to a second flange portion extending substantially parallel to the first flange portion, said pair of flange elements defining a longitudinally extending groove opening away from the bead, said cap member having a center portion connected to flange portions by offset portions to provide a configuration matching the configuration of the pair of flange elements, said cap member being secured to the outer edges of the second flange portions with the center portion and offset portions being received in the groove to form a flange arrangement with continuous edges for the runners with a longitudinal channel, each of the cross-runners having ends with a notch formed through the second flange portions and a part of the offset portions to provide offset surfaces for the end surfaces of the second flange portions which offset surfaces are offset from the end surfaces of the first flange portions, remaining parts of the offset portions and the webs, said webs having a tongue extending beyond the end surfaces of the bead and flange portions, each of the webs of the main runners having an elongated slot for receiving the tongues of the cross-runner with the notch receiving the continuous second flange portion of the main runner and the remaining parts of the offset portions and the first flange portions being spaced from the offset portion of the main runner, each

of the tongues having first means cooperating with the elongated slot to lock the tongue in the slot with the offset surface loosely engaging the continuous edges of the second flange portions of the main runner and second means cooperating with the second means of another tongue to interconnect the two tongues together to form an end-to-end joint between cross-runners extending into the elongated slot from opposite directions, said first means being a tab bent from the tongue to form a catch surface facing away from the end of the tongue.

4,677,803

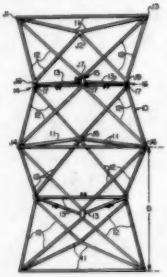
DEPLOYABLE GEODESIC TRUSS STRUCTURE

Martin M. Mikulas, Jr., Poquoson; Marvin D. Rhodes, and J. Wayne Simonton, both of Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 20, 1986, Ser. No. 831,371

Int. Cl.[4] E04H *12/18*

U.S. Cl. 52—646 **11 Claims**



1. A deployable geodesic truss structure for movement between a collapsed stowed state and an elongated erected state comprising:

a first equilateral triangle formed by three battens connected at their ends by first, second, and third joint means;

a second equilateral triangle formed by three battens connected at their ends by fourth, fifth and sixth joint means;

said first and second equilateral triangles being spaced from one another;

six longitudinal cross members connected between said first, second and third joint means and said fourth, fifth and sixth joint means, said cross members being connected so that a first cross member extends from said first joint to said sixth joint, a second cross member extends from said third joint to said fourth joint, a third cross member extends from said first joint to said fifth joint, a fourth cross member extends from said second joint to said fourth joint, a fifth cross member extends from said second to said sixth joint and a sixth cross member extends from said third joint to said fifth joint;

the first and second cross members being connected by a seventh joint means intermediate their lengths, the third and fourth cross members being connected by an eighth joint member intermediate their lengths and said fifth and sixth cross members being connected by ninth joint means intermediate their lengths;

three actuator means connected to their ends by said seventh, eighth, and ninth joint means, said actuator means each having an elongated member and means to vary the length of said member whereby the position in space of said seventh, eighth, and ninth joint means can be varied from a compact stowed position wherein all nine of the joints of said structure are spaced into a position where all said joints are substanially adjacent to the same plane with joint pairs one and four; two and five; and three and six each substanially adjacent to three points on said plane to an erected position wherein the first through third, fourth through sixth and seventh through ninth joints of the structure are substanially spaced from one another.

4,677,804

DEMOUNTABLE FRAMES

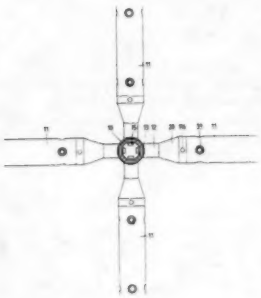
Richard E. Holt, 23 Beauchamp Avenue, Leamington Spa, England

Filed Aug. 27, 1984, Ser. No. 644,396

Claims priority, application United Kingdom, Aug. 26, 1983, 8323093

Int. Cl.[4] F16B *7/00*

U.S. Cl. 52—648 **17 Claims**



1. A demountable frame including two spaced structural members each provided with a screw-threaded aperture, said spaced member arranged with each of said apertures aligned with and facing the other of said apertures at a predetermined distance apart and a transverse structural member extending between said spaced members, each end of said transverse member having a projection extending therefrom, each said projection comprising a pin having a screw-threaded portion at each end thereof and a shoulder intermediate said screw-threaded portions, the screw-threaded portion at the outer end of said pin engageable in a respective one of the apertures to locate said transverse member to the respective one of said spaced member, the pin of each of said projections being temporarily partially axially retractible into the respective end of said transverse member, thereby to reduce th overall length of said transverse member and said projections to less than said distance to permit said transverse member to be fitted between and removed from said two spaced members without moving them apart beyond said distance; a tubular spacer on said pin between the outer end thereof and said shoulder, said spacer having a length such that said spacer is gripped between the outer surface of the adjacent one of said spaced members and said shoulder when the screw-threaded portion at the outer end of said pin has been screwed tightly into the screw-threaded aperture of said one spaced member, the end of the spacer which abuts against the outer surface of said one spaced member having a shape complementary to the shape of said outer surface, said projection also including a locking thimble movable into screw-threaded engagement with the screw-threaded inner end of said pin, said thimble being movable on said screw-threaded inner end to a locking position in which

said thimble engages against the respective end of said transverse member, said shoulder being accessible through an aperture in said thimble, whereby said pin is rotatable in one direction to effect disengagement from said aperture in said one spaced member and corresponding axial movement of said pin relatively to said transverse member to effect said temporary retraction and in the other direcion to engage said pin in said aperture in said one spaced member.

4,677,805

STRUCTURAL CONNECTOR

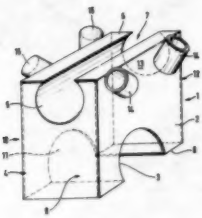
Uriel Schleisner, 68-70 Bar- Kochba Street, Petach Tiqva, Israel

Filed Sep. 12, 1985, Ser. No. 775,491

Claims priority, application Israel, Nov. 1, 1984, 73390; Mar. 1, 1985, 74479

Int. Cl.[4] F16L *39/00*

U.S. Cl. 52—648 **12 Claims**



1. A structural element connecting joint comprising a hollow multi-sided part with at least two pairs of opposite sides with the sides in each said pair arranged in spaced parallel relation and with said sides in each said pair extending transversely of the sides of the other said pair, each of said sides having an elongated direction, each of said pair of sides having axially aligned openings through each side of said pair with the axis of the openings in one said pair of sides extending transversely of the axis of the other said pair of sides and said axes being spaced apart in the elongated direction of said sides, said aligned openings arranged to receive elongated structural elements extending therethrough with the structural elements disposed transversely of one another, and a number of axially extending spigot-like sleeves secured to and projecting outwardly from at least one of said sides of said part with the axes of each of said sleeves extending obliquely outwardly from the side to which said sleeve is secured, the point of securement of each of said sleeves to said sides being spaced from said openings and the axes of said sleeves extending angularly relative to the axes of said openings.

4,677,806

WOODEN BUILDING SYSTEM WITH FLANGE INTERLOCK AND BEAMS FOR USE IN THE SYSTEM

Roger L. Tuomi, Madison, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

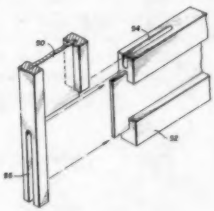
Filed Apr. 4, 1986, Ser. No. 848,175

Int. Cl.[4] E04C *3/11*

U.S. Cl. 52—656 **17 Claims**

1. A vertical rectilinear frame for a building comprising a floor beam, right and left wall beams, and a roof beam, said floor, wall and roof beams forming a joint at each of the four junctions of said floor, wall and roof beams, wherein said beams are interlocked at each joint to form a unitized frame having structural continuity among all its beams, whereby said vertical frame functionally comprises a single high strength structural component of said building, each of said beams comprising a web and a plurality of flanges, wherein each of said wall beams at the interlock joint with said roof beam includes a web segment which longitudinally extends beyond its flanges to define an extended web segment, wherein said extended web segment is connected to said roof beams flanges in slots therein, wherein said extended web segment is coplanar and at least nearly butting with said roof beam's web,

wherein one beam of each pair of the interlocking beams at the floor-wall joints includes a web segment which longitudinally extends beyond at least one flange of said one



beam to define an extended web segment on said one beam, wherein said extended web segment on said one beam is connected to at least one flange of the other beam of said pair, wherein said connection is at points across said segment's substantially entire width, wherein said extended web segment on said one beam is coplanar and at least nearly butting with said other beam's web.

4,677,807

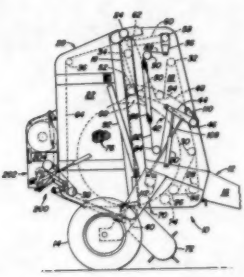
SYSTEM FOR AUTOMATICALLY ENVELOPING A LARGE ROUND BALE WITH A WRAPPING

Michael J. Verhulst, and Henry D. Anstey, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 8, 1986, Ser. No. 883,791

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—118 **7 Claims**



1. In a large round baler including a first device for wrapping a bale located in a bale-forming chamber with twine, said first device having a control circuit including:

(a) a sump;

(b) a pump;

(c) a double acting twine arm cylinder for moving a twine arm between first and second laterally spaced locations adjacent the bale-forming chamber;

(d) a twine arm cylinder control means coupled to the pump, sump and cylinder for selectively cycling the cylinder for moving the twine arm from its first to its second location and then back to the first location when a bale of a desired size is located in the bale-forming chamber, the improvements comprising: a second device for alternatively wrapping a bale with a wrap material having a width substantially commensurate with said chamber, the second device including:

(i) a pair of selectively drivable wrap material drive rolls

for feeding wrap material toward said chamber when driven;

(ii) normally disengaged drive means coupled to one of said pair of drive rolls;

(iii) a double-acting hydraulic wrapper feed control cylinder coupled to said drive means for establishing engagement thereof only during movement of the wrapper control cylinder in a first direction; and said wrapper control control cylinder being coupled to the twine arm cylinder control means in parallel with said twine arm cylinder for moving in said first direction when the twine arm cylinder is operated to move the twine arm from its first to its second location.

4,677,808

ASSEMBLY FOR ASSORTED PACKINGS WITH DIFFERENT PRODUCTS

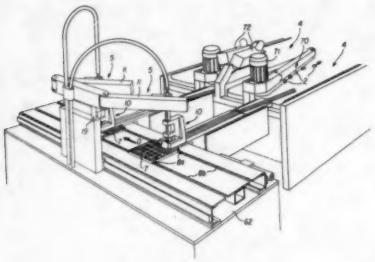
Alexis Chenevard, Morges, Switzerland, assignor to Sapal, Societe Anonyme des Plieuses Automatiques, Ecublens, Switzerland

Continuation of Ser. No. 708,972, Mar. 7, 1985, abondoned. Filed Oct. 22, 1986, Ser. No. 922,831

Claims priority, application Switzerland, Mar. 15, 1984, 1294/84

Int. Cl.[4] B65B *5/00*

U.S. Cl. 53—238 **9 Claims**



1. An assembly for filling preformed containers of assorted packings with different kinds of products, comprising several rigidly fixed transport bands for respectively advancing products of a same kind disposed in a row to corresponding distributing means, at least one belt conveyor associated with each distributing means for advancing the products of a same kind to a filling station for filling the containers with this kind of products, and transport means for intermittently advancing the containers to said filling station, and filling station comprising depositing means for gripping and removing the products from the belt conveyor and depositing the products in said containers wherein the belt conveyor associated with each said distributing means is extensibly and pivotally mounted at a first end adjacent said distributing means on a fixed pivot, and wherein a second end of said belt conveyor remote from said distributing means carries said depositing means, whereby said second end and said associated depositing means are movable together in two directions essentially perpendicular to each other to reach any point of an area covering at least the surface of a preformed container which has been previously positioned in the filling station.

4,677,809

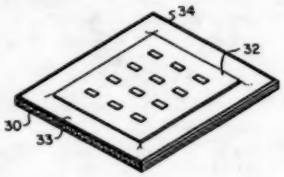
METHOD OF MAKING PACKING MATERIAL WITH ANTI-STATIC COATING

Stuart G. Long, South Laguna, and Michael J. Maciocia, Ontario, both of Calif., assignors to General Dyanmics, Pomona Division, Pomona, Calif.

Continuation of Ser. No. 733,221, May 10, 1985, abandoned, which is a division of Ser. No. 597,974, Apr. 9, 1984, abandoned. This application Jun. 3, 1986, Ser. No. 870,039

Int. Cl.[4] B65B *11/52*

U.S. Cl. 53—427 **2 Claims**



1. A method of making a sealed, anti-static container, comprising the step of employing a skinpackaging procedure to heat seal a sealing sheet of flexible, thermoplastic, electrostatic-free material to a flat, uniplanar sheet of backing material wherein said sheet of backing material comprises a first layer of substantially rigid substrate material and a second layer including an organic plastic heat-sealable material formed on said first layer according to a predetermined manufacturing method separate from said skin-packaging method, said predetermined manufacturing method including the step of adding a tertiary animal fatty amine to said sealing sheet and

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4,677,810

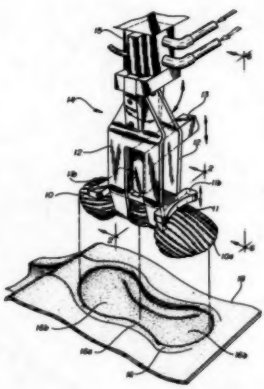
METHOD AND APPARATUS FOR PLACING FLEXIBLE WEB PIECES INTO CONCAVE SHAPED SHELLS

John D. Spano, Bordentown Twsp., Burlington County, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Aug. 15, 1986, Ser. No. 897,224

Int. Cl.[4] B65B *1/24*

U.S. Cl. 53—428 **16 Claims**



10. A method for placing multiple elongated pieces of flat fibrous web each into corresponding concave formed shells, said method comprising:

(a) providing a plurality of corrugated flat flexible web pieces disposed in parallel relation to each other on rails of a shuttle conveyor;

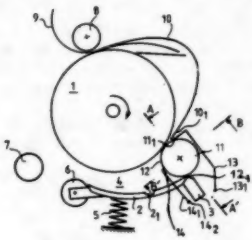
(b) moving the parallel web pieces laterally apart from each other while dispposed on the shuttle conveyor;
(c) picking up each said web piece while simultaneously longitudinally crimping the piece to have a convex-shaped upper surface;
(d) transferring laterally each said crimped web piece and moving the adjacent parallel web pieces longitudinally while simultaneously transferring the web pieces to the formed shells; and
(e) placing each said crimped web piece into a concave formed shell which is shaped to retain the crimped web piece in the fomed shell, including additionally bending upwardly the opposite ends of each said web piece while inserting the piece into the concave shell.

4,677,811

METHOD OF AND INSTALLATION FOR PUTTING STACKS OF COINS INTO CARTRIDGES

Marcel Brisebarre, Saint Genis Pouilly, France, assignor to Monee S.A., France

Filed Apr. 24, 1986, Ser. No. 856,044
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—456 **24 Claims**



1. A method of putting stacks of coins into tubes, comprising the steps of:
partially rolling up a sheet of paper to form at least one complete circumference of a tube of which the circular cross-section is slightly greater than the diameter of the coins to be packaged,
placing a stack of coins inside the tube,
moving the stack of coins and the tube towards one of the ends of a corridor, said corridor being defined by two surfaces having parallel generatrices, one of said surfaces being adapted for movement in the direction of displacement of the stack and of the tube so that it displaces the tube and the stack of coins along the corridor by rolling on the non-moving surface, and
continuing to roll up the sheet of paper around the stack of coins.

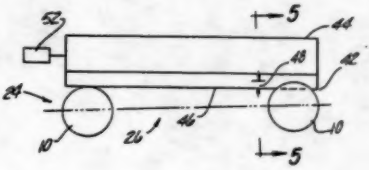
4,677,812

METHOD FOR SEALING TAMPER-EVIDENT CAPSULES

Amad Tayebi, Westford, Mass., assignor to Capsule Technology International, Ltd., Windsor, Canada

Continuation of Ser. No. 614,746, May 29, 1984, which is a continuation-in-part of Ser. No. 529,162, Sep. 2, 1983, abandoned. This application Aug. 18, 1986, Ser. No. 897,381
Int. Cl.[4] B65B *51/10*
U.S. Cl. 53—477 **10 Claims**

1. A method for sealing a capsule of the type commonly used to contain medication and having an elongated cylindrical body and cylindrical cap that is assembled by slidably inserting said body into said cap so that a portion of the cap overlies a portion of the body, so that an attempt to separate an assembled, sealed capsule will result in the destruction of the capsule to thereby indicate tampering with same, said method for sealing comprising the steps of:
moving an assembled capsule cap and body and a thin, elongated bar relative to each other such that said assembled capsule starts its relative movement with its axis spaced a first distance from an edge of one end of said bar and ends its relative movement with its axis spaced a second distance from the edge of the other end of said bar, where said first distance is greater than said second distance, and said capsule rotated during said relative movement, and
heating said elongated bar such that it is hottest at a first point somewhere between the ends of said bar and coolest



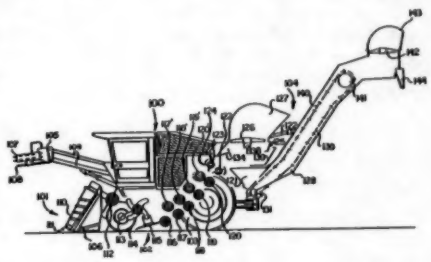
at the ends of said bar, the temperature of the edge of said bar at a second point closest to its said one end and at which the edge of said heated bar comes into contact with said capsule being sufficient to heat plasticize the material from which said capsule cap and body are made so that they will deform to thereby form an indentation circumferentially around said assembled capsule at a point where said cap and said body overlie each other, the indentation being deep enough that an attempt to separate said cap from said body will result in them being fractured and thereby indicate tampering with the sealed capsule.

4,677,813

CANE HARVESTER

Rodney A. Stiff; Malcolm J. Baker, and Leslie J. Lester, all of Bundaberg, Australia, assignors to Austoft Industries Limited, Canada

Division of Ser. No. 423,262, Sep. 24, 1982, Pat. No. 4,555,896. This application Jul. 18, 1985, Ser. No. 756,277
Claims priority, application Australia, Nov. 20, 1981, PF1633
Int. Cl.[4] A01D *34/03*
U.S. Cl. 56—13.9 **5 Claims**



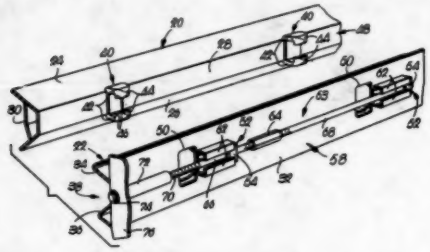
1. A sugar cane harvester comprising chopping means to chop the cane crop into billets, a cleaning chamber to separate the chaff in aid crop from said billets after said crop passes through said chopping means, an energy absorbing plate mounted in said cleaning chamber to contact said billets after said billets leave said chopping means, said plate being adjustably mounted to contact a greater or lesser amount of crop after said crop passes through said chopping means into said cleaning chamber.

4,677,814

QUICK ATTACH APPARATUS FOR CROP HARVEST HEADER AND THE LIKE

J. Dale Anderson; Kenneth R. McMillen, both of Canton, and Arnold E. Goertz, Buhler, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jun. 8, 1984, Ser. No. 618,821
Int. Cl.[4] A01D *41/06, 47/00;* A01B *51/00*
U.S. Cl. 56—15.6 10 Claims



1. In a farm implement having an elongated header-supporting member, and a crop-handling header having an elongated frame member, a mechanism for releasably clamping the members together comprising:

a plurality of keepers spaced longitudinally of the frame member and rigidly secured thereto,

the supporting member having an opening for each keeper respectively through which the keepers extend, and a latch for each keeper respectively shiftably mounted on the supporting member,

each keeper having a passage for slidably receiving its latch; and

a latch shifter for wedging the latches into their passages between the supporting member and the keepers to draw the members into progressively tighter interengagement,

the header and its frame member being disposed forwardly of the supporting member with the members having their longitudinal axes disposed transversely of the normal path of travel of the implement, the supporting member having an upright, flat rearwardly facing surface, and the keepers extending rearwardly from the frame member beyond said surface, the latches being reciprocable longitudinally of said surface in sliding contact therewith as the latches are shifted into their passages,

each keeper having a tapered edge spaced rearwardly of said surface, each latch having a rear edge sloped to mate with its corresponding tapered edge, said tapered edges being disposed to slidably receive said rear edges during shifting of the latches along said surface.

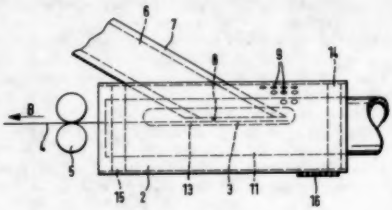
4,677,815

FRICTION ROLLER FOR OPEN-END FRICTION SPINNING

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Mar. 6, 1986, Ser. No. 836,748
Claims priority, application Fed. Rep. of Germany, May 28, 1985, 3519102
Int. Cl.[4] D01H *1/135;* D02G *1/08*
U.S. Cl. 57—401 17 Claims

1. Friction roller construction for open-end friction spinning device of the type having a roller yarn forming cover surface portion that imparts friction to fibers and forming yarn in a yarn formation zone, said yarn forming surface portion exhibiting an outer surface texture which includes a plurality of microchannels extending essentially in the longitudinal direction of the roller over a substantial length of the roller.

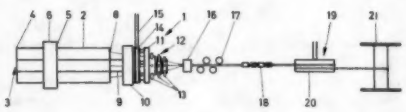


4,677,816

STRANDING MACHINE

Stanley Woxholt, Vereeniging, South Africa, assignor to Sharon Wire Mill Corporation (Proprietary) Limited, Transvaal Province, South Africa

Filed Dec. 16, 1985, Ser. No. 809,330
Claims priority, application South Africa, Dec. 18, 1984, 84/9847
Int. Cl.[4] D07B *3/00*
U.S. Cl. 57—59 2 Claims



1. A stranding machine for making multi-stranded cables and the like, filament feeding means comprising elongated tubular filament coil support devices including a central support device for supporting a coil of a core filament and a plurality of winding filament support devices for supporting coils of winding filaments to be wound around said core filament, means external and intermediate the ends of said support devices for mounting the winding filament support devices symmetrically about and with the axes thereof parallel to the axis of said central support device and providing for rotation of said support devices about the axis of said central support device, said support devices having filament feed orifices at the forward ends thereof and being open at the opposite ends for loading coils of filaments therein.

4,677,817

TRAVELLERS FOR SPINNING MACHINERY

Hiroyuki Kanai, Ashiya, Japan, assignor to Kanai Juyo Kogyo Kabushiki Kaisha, Itami, Japan

Filed Dec. 19, 1985, Ser. No. 810,711
Int. Cl.[4] D01H *7/60*
U.S. Cl. 57—125 5 Claims

1. A traveller for spinning made of a hard steel wire or an alloy steel wire body, having a surface coated with a ceramic

nitride layer selected from the group consisting of TiN, TiCN, ZrN, Si_3N_4, TaN, AlN, GaN, BN and InV, said coating being

at least at the surface of a part which makes contact with a ring.

4,677,818

COMPOSITE ROPE AND MANUFACTURE THEREOF

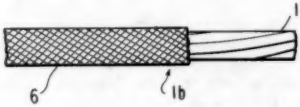
Kenji Honda, deceased, late of Aichi, Japan (by Reiko Honda, executor), and Tadaaki Sawafuji, Aichi, Japan, assignors to Toho Beslon Co., Ltd. and Tokyo Rope Manufacturing Co., Ltd., both of, Japan

Filed Jul. 11, 1985, Ser. No. 753,838

Claims priority, application Japan, Jul. 11, 1984, 59-143995

Int. Cl.[4] D02G *3/36, 3/38, 3/40*

U.S. Cl. 57—224 **22 Claims**



1. A composite rope obtained by a process comprising

(1) impregnating a fiber core of a reinforcing fiber bundle with a thermosetting resin,

(2) coating the outer periphery of the resin-impregnated fiber core with fibers to prevent leakage of said resin from said fiber core, and

(3) curing the thermosetting resin with heat.

4,677,819

METHOD AND APPARATUS FOR OPERATING AN OPEN-END FRICTION SPINNING MACHINE

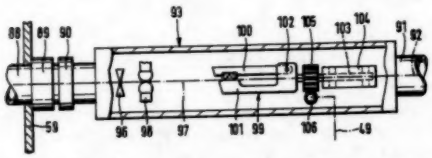
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Mar. 20, 1986, Ser. No. 841,936

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510512

Int. Cl.[4] D01H *13/22, 13/32*

U.S. Cl. 57—264 **26 Claims**



1. A method for operating an open-end friction spinning machine of the type having a plurality of spinning units with:

drivable friction surface means defining a yarn formation zone; and

feeding means for feeding fibers to the yarn formation zone, said fibers passing through the yarn formation zone along a predetermined path,

said process comprising:

monitoring yarn twist of yarn formed at a spinning unit;

comparing the monitored yarn twist with a predetermined desired yarn twist value; and

adjusting at least one parameter of spinning conditions in response to deviations from the predetermined desired yarn twist without changing the predetermined path along which the fibers pass through the yarn formation zone.

4,677,820

SUCTION CONTROL ARRANGEMENT FOR OPEN-END FRICTION SPINNING

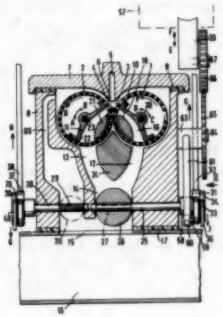
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,475

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514905

Int. Cl.[4] D01H *15/02, 1/135, 7/898*

U.S. Cl. 57—401 **18 Claims**



1. Apparatus for open-end friction spinning comprising:

movable friction surface means defining a yarn forming region,

suction device means acting on said yarn forming region,

valve means for interrupting operation of the suction device means when spinning operations are interrupted and for controlling the magnitude of suction applied during spinning operations,

suction device interruption adjusting means for adjusting the movement of the valve means to a position for accommodating interruption of the spinning operations, and

suction device control adjusting means for adjusting the control of the valve means to control the magnitude of suction applied during spinning operations, said suction device control adjusting means operating independently of said suction device interruption adjusting means.

4,677,821

PROCESS START-UP

Anthony P. Smith, Wilton, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 26,799, Apr. 3, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 347,027

Claims priority, application United Kingdom, Apr. 13, 1978, 14564/78; Feb. 12, 1979, 7904905; Mar. 8, 1979, 7908246

Int. Cl.[4] F02C *7/27*

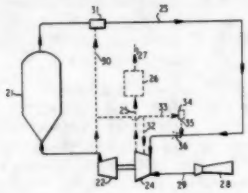
U.S. Cl. 60—39.02 **3 Claims**

1. A start-up process for a chemical processing plant including at least one compressor, and heat recovery turbine, the start-up process comprising the steps:

providing ducting means for receiving exhaust from a gas turbine engine and directing same into the heat recovery turbine;

physically and operatively engaging the gas turbine engine through the ducting means to the heat recovery turbine;

operating the gas turbine engine so that exhaust therefrom provides start-up energy to the heat recovery engine;



physically and operatively disengaging the gas turbine engine from the heat recovery turbine once said chemical processing plant becomes self-sustaining; and

utilizing a burner supplied with air from the compressor, said process further comprising the step of selectively introducing additional heated air from the burner into the heat recovery turbine so that the additional heated air supplements said exhaust from said gas turbine engine to provide sufficient start-up energy.

4,677,822

GAS TURBINE COMBUSTOR

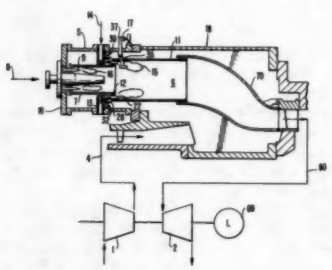
Nobuyuki Iizuka; Katsukuni Hisano; Katsuo Wada; Masashi Kunihiro; Fumiyuki Hirose; Yoji Ishibashi; Isao Sato; Osamu Arai; Hiroshi Inose, all of Hitachi, and Osamu Sakuda, Jyuoh, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 831,855

Claims priority, application Japan, Feb. 22, 1985, 60-32703

Int. Cl.[4] F02C *3/14*

U.S. Cl. 60—39.23 **8 Claims**



1. A gas turbine combustor including air flow rate control means, the combustor comprising:

an inner cylinder means for forming a combustion chamber means therein with an air supply port in a circumferential wall thereof; fuel nozzle means for supplying a fuel into the combustion chamber means; outer cylinder means provided along an exterior of the inner cylinder means for forming a space for air passage between an outer surface of the inner cylinder means and an inner surface of the outer cylinder means; control means provided on an outer side of the inner cylinder means and adapted to be movable substantially in an axial direction of the inner cylinder means for regulating the opening of the air supply port, said control means is cylindrically shaped and surrounds the air supply port in the combustion chamber means; flexible means for supporting the control means in order to maintain the gap between the control means and an exterior of the air supply port on the inner cylinder means and for allowing movement of the control means substantially in the axial direction of the inner cylinder means, said flexible means is circularly-shaped and has a larger diameter than a diameter of the control means and drive means for moving the control means substantially in the axial direction of the inner cylinder means; and wherein the flexible means is connected with the drive means through a second flexible means spaced in an axial direction of the inner cylinder means with respect to the first flexible means.

4,677,823

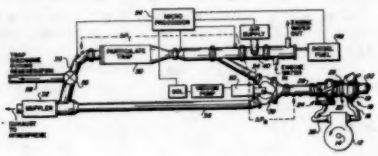
DIESEL ENGINE PARTICULATE TRAP REGENERATION SYSTEM

James A. Hardy, Playa Del Rey, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 1, 1985, Ser. No. 794,346

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—274 **14 Claims**



1. A particulate trap system comprising:

a particulate trap for filtering exhaust gas entrained particles;

a bypass conduit in parallel with said particulate trap, said particulate trap and by-pass conduit connected to carry engine exhaust gas by suitable piping;

valve means for directing exhaust gas to said trap or said bypass conduit;

burner means upstream of said trap for burning the filtered particles, said burner means including a fuel and air supply systems, said fuel supply system further including a fuel source, a fuel pump, and means for varying the pressure of the fuel supplied to said burner means, said means for varying further including two pressure relief valves in parallel with each other and both in parallel with said fuel source and pump, and a means for opening and closing one of said pressure relief valves; and

means for controlling the position of said valve means and the operation of said burner means.

4,677,824

OUTPUT CONTROL APPARATUS FOR STIRLING ENGINES

Masahiko Hasegawa, Anjyo; Yoshihiro Naito, Nagoya; Masaru Tsunekawa, Aichi, and Yutaka Momose, Anjyo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Sep. 26, 1986, Ser. No. 911,871

Claims priority, application Japan, Sep. 26, 1985, 60-214065

Int. Cl.[4] F02C *1/04*

U.S. Cl. 60—521 **2 Claims**

1. A Stirling engine control apparatus comprising:

a working gas compressor;

a working gas storage tank;

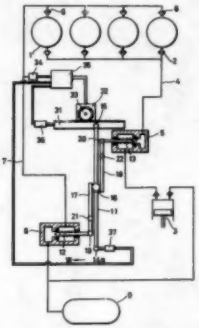
a maximum cycle pressure line connecting a working space to said working gas compressor and said working gas tank via a first check valve;

a pressure reducing valve provided in said maximum cycle pressure line;

a minimum cycle pressure line connecting said working space to said working gas storage tank via a second check valve;

a pressure boost valve provided in said minimum cycle pressure line;

an operating lever pivotable about a movable fulcrum for controlling opening and closing of said pressure reducing valve and said pressure boost valve;



a movable member on which the movable fulcrum of said operating lever is provided; and

control means for positionally shifting said movable member upon comparing a target pressure corresponding to displacement of said operating lever and pressure within said minimum cycle pressure line.

4,677,825

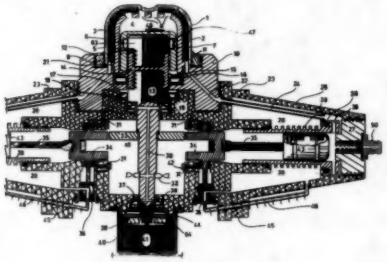
THERMOMOTOR

Oscar L. Fellows, P.O. Box 201207, Austin, Tex. 78720

Filed Jun. 12, 1986, Ser. No. 873,686

Int. Cl.[4] F02G *1/04*

U.S. Cl. 60—525 **1 Claim**



1. A Stirling cycle machine of unique mechanical arrangement, comprising a rotatable engine body having a heater head at one end, with a lining of open-cell, foamed metal bonded to its inner surface; a displacer which reciprocates within the heater head; a rotor housing at the opposite end from the heater head, composed of a material which is permeable to electric and magnetic fields, so that said fields pass through said housing uneffected in order to induce currents into the rotor housed within said housing; a plurality of cylinders disposed radially about the circumference of said engine body; a plurality of pistons disposed respectively in said cylinders, said pistons connected respectively to a plurality of rotatable crankshafts disposed within the engine body and positioned with respect to the axes of the reciprocating pistons, said crankshafts connected by gears or other connecting means to a rotatable central shaft so that the rotation of said central shaft is related to and dependent upon the reciprocating movements of said pistons; a plurality of rollers affixed to the sides of said central shaft at one end, which connect the central shaft to the displacer by means of a camming groove machined into the displacer in which said rollers ride; an electromagnetic induction rotor affixed to the opposite end of said central shaft which rotates in conjunction with the central shaft; a plurality of centrifugal pumps connected by means of coupled shafts to the aforesaid crankshafts, said pumps housed within the engine body and connected by means of coolant passages within the engine body, to heat exchangers affixed externally to the engine body and disposed adjacent and parallel to the exterior plane of the engine body; an electromagnetic stator comprised of field windings formed of electrical conductors, said stator mounted externally to, and unconnected mechanically to, the engine body; an engine mounting frame which supports the engine body and attaches the entire machine to the device or load to be driven, or to an engine support of some sort, said frame also supporting the stator and peripheral equipment; a connecting means affixed to the body of the engine for the purpose of transmitting the motion of the engine body to an output shaft mounted in the engine frame; a plurality of engine support bearings which support the engine body within said frame; filler and drain plugs located in the exterior surface of the engine body for the purpose of adding or removing coolant or lubricant; a seal mounted on, an disposed annularly about, the upper end of the ceramic coupling which joins the displacer shaft and displacer shaft head, said seal composed of titanium or other high temperature material; a hollow washer and ring seal located beneath the heater head liner, and disposed annularly about the displacer shaft coupling, said seal composed of titanium or other high temperature material; a seal located in the upper displacer shaft bearing support plate, and disposed annularly about the displacer shaft; a seal located in the lower displacer shaft bearing boss, and disposed annularly about the rotor end of the displacer shaft; an oil circulating pump or means attached to, and disposed annularly about, the displacer shaft, said means promoting lubricant to the displacer shaft bearings and other engine parts requiring lubrication; a plurality of bearings within the engine body, which support the displacer shaft and piston crankshafts in their respective positions; a one-way valve located atop the displacer, said valve provided for the purpose of allowing automatic escape of working gas entrapped beneath the displacer; a plurality of roller bearings affixed to the sides of the displacer, which guide the displacer within a heater head liner which fits inside the heater head in close contact with the metal foam lining, said rollers riding in guide slots made into the inside surface, parallel to the axis of said heater head liner; a plurality of quick-connect valves located in the respective cylinder sleeve retaining fittings which seal the cylinder cavities, at the surface of the engine body, said valves allowing the addition or removal of the working gas, a ceramic thermal break which fits between the heater head assembly and the engine body, to reduce conduction between the heater head and engine body; a plurality of passages made through the ceramic thermal break, which conduct the working gas between the heater head and the gas cooler tubes to the cylinders, said gas cooler tubes disposed from the ceramic break to the respective cylinders through the coolant jacket of the engine body; a plurality of porous metal discs, said discs disposed within the aforesaid passages in the ceramic break, said discs acting as regenerative devices which remove and restore thermal energy from and to the working gas as it passes through said discs.

4,677,826

OUTBOARD MOTOR WITH TURBO-CHARGER

Tomio Iwai, Hamamatsu, and Yukio Matsushita, Iwata, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 614,439, May 25, 1984, Pat. No. 4,630,446. This application May 30, 1986, Ser. No. 868,754

Claims priority, application Japan, May 27, 1983, 58-92340; May 27, 1983, 58-92341; May 27, 1983, 58-92342

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—602 **6 Claims**

1. In a turbo-charger arrangement for a two cycle, crankcase compression, multiple cylinder internal combustion engine comprising an exhaust chamber for receiving exhaust gases from the cylinders, an exhaust system including an exhaust pipe extending from said exhaust chamber, an expansion chamber, said exhaust pipe discharging into said expansion chamber for receipt of said exhaust gases from said exhaust chamber and a turbo-charger having a turbine stage inlet and exhaust, the improvement comprising said turbine stage inlet being in direct communication with said exhaust chamber for driving the turbine from the exhaust gases in said exhaust chamber.

4,677,827

NATURAL GAS DEPRESSURIZATION POWER RECOVERY AND REHEAT

Thirthahalli A. Shenoy, Whitehall, and John C. Tao, Perkiomenville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 22, 1985, Ser. No. 704,679

Int. Cl.[4] F01K *23/04, 25/06*

U.S. Cl. 60—648 **13 Claims**

1. A process for reduction in pressure of natural gas with the recovery of net power and the control of the temperature of the low pressure natural gas product by heat exchange with ambient atmosphere comprising the step of:

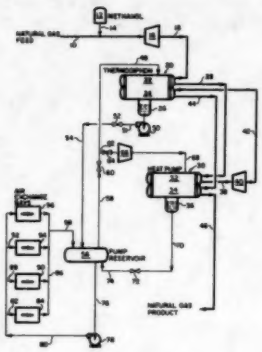
(a) introducing high pressure natural gas at a pressure in the range of 100 to 2000 psia into an expansion turbine;

(b) expanding the natural gas to a low pressure in the range of 40 to 100 psia and a resulting low temperature in the expansion turbine and recovering power from said turbine;

(c) rewarming the low pressure, low temperature natural gas in at least two stages by heat exchange with an ambient atmosphere comprising:

(1) indirect heat exchange of said natural gas with a refrigerant in a thermosiphon cycle which indirectly heat exchanges with said ambient atmosphere;

(2) indirect heat exchange of the natural gas of substep (1) with a refrigerant in a heat pump cycle which indirectly heat exchanges with said ambient atmosphere;



(d) recovering the natural gas at a low pressure and at a relatively warm temperature of at least 35° F.

4,677,828

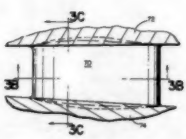
CIRCUMFERENTIALLY AREA RULED DUCT

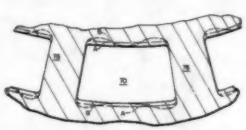
John A. Matthews, Melrose; Edmund E. Striebel, South Windsor; Domingo Sepulveda, Vernon, and Francis C. Pane, Jr., South Windsor, all of, assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 504,996, Jun. 16, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 671,385

Int. Cl.[4] F02C *1/00*

U.S. Cl. 60—751 **2 Claims**





1. In combination, a gas turbine engine having a burner for receiving a working medium, an annular diffuser having an inner conically shaped wall and an outer conically shaped wall diverging relative to each other for diffusing said working medium prior to entering said burner, at least eight, but less then 20, equally spaced struts between said inner wall and outer wall supporting said walls in spaced relationship, said struts defining with said inner and outer walls open-ended passageways within said diffuser and being an obstruction to the flow passing therethrough, means for compensating for said obstruction to obtain a relatively uniform velocity profile in the circumferential direction, said means including a circumferential increase in cross sectional flow area of each of the diffuser passageways formed by each of said inner and outer walls on either side of each of said struts, and said inner and outer walls having a displaced portion of concave shape merging with an adjacent strut and further including convex wall

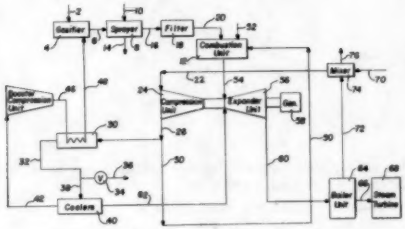
portions disposed between each pair of adjacent concave portions.

4,677,829

METHOD FOR INCREASING THE EFFICIENCY OF GAS TURBINE GENERATOR SYSTEMS USING LOW BTU GASEOUS FUELS

David H. Archer, Ross Township, Allegheny County, and M. Mushtaq Ahmed, Turtle Creek, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 827,036
Int. Cl.[4] F02C *3/28*
U.S. Cl. 60—39.02 **14 Claims**



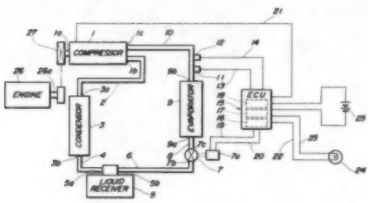
1. In a process for operating a gas turbine system containing a compression unit, a combustion unit and an expansion unit to operate a generator, and wherein a portion of the air from said compression unit is bled from the system so as to prevent surges in said compression unit by limiting the flow of combustion gases to said expansion unit, the improvement comprising using a gaseous fuel having a low BTU value in said combustion unit with the discharge of hot combustion exhaust gases therefrom, heating the air charged to said compression unit and reducing the volume of air from said compression unit that is bled from the system and thereby increasing the efficiency of the gas turbine system.

4,677,830

AIR CONDITIONING SYSTEM FOR AUTOMOTIVE VEHICLES

Seiji Sumikawa, and Ichiro Noguchi, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1985, Ser. No. 774,760
Claims priority, application Japan, Sep. 17, 1984, 59-192607
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—126 **1 Claim**



1. In an air conditioning system for an automotive vehicle having a passenger compartment, including a compressor having a driving shaft driven by an automotive engine having an output shaft to compress refrigerant circulating in said system, an electromagnetic clutch interposed between said driving shaft of said compressor and said output shaft of said engine, a condenser for cooling the refrigerant compressed by said compressor to liquefy same, an expansion valve for controlling the flow rate of the liquefied refrigerant to proper values corresponding to thermal load on said air conditioning system, an evaporator for evaporating the liquefied refrigerant to cool air to be blown into said passenger compartment through heat exchange thereof with the refrigerant, a temperature sensor and a pressure sensor for detecting, respectively, the temperature and pressure of the refrigerant at an outlet of said evaporator, and an expansion valve control means for controlling the opening of said expansion valve in response to output signals from said temperature sensor and said pressure sensor,

the improvement comprising:

electronic control means in which said expansion valve control means is provided, said electronic control means including conversion means for electrically converting the pressure of refrigerant detected by said pressure sensor to a corresponding saturation temperature of the refrigerant, and determining means for electronically determining whether or not the quantity of the refrigerant in said air conditioning system is smaller than a required valve through comparison of the difference between the temperature of the refrigerant detected by said temperature sensor and the corresponding saturation temperature of the refrigerant obtained by the conversion by said conversion means with a predetermined reference value, said determining means including means for determining whether or not the quantity of the refrigerant is smaller than said required quantity immediately after the start of said compressor; and

indicator means controlled by said electronic control means for indicating the existence of an abnormality when said determining means determines that the quantity of the refrigerant is smaller than said required value;

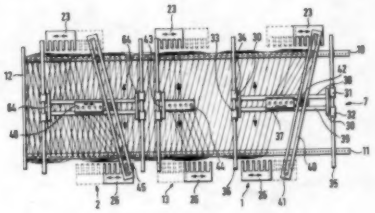
said expansion valve control means also being operable to interrupt power transmission from said engine to said compressor by disengaging the electromagnetic clutch when said determining means determines that the quantity of the refrigerant is smaller than said required value.

4,677,831

APPARATUS FOR LAYING TRANSVERSE WEFT THREADS FOR A WARP KNITTING MACHINE

Roland Wunner, Schwarzenbach/Wald, Fed. Rep. of Germany, assignor to Liba Maschinenfabrik GmbH, Naila, Fed. Rep. of Germany

Continuation of Ser. No. 674,648, Nov. 26, 1984. This application May 5, 1986, Ser. No. 860,699
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3343048
Int. Cl.[4] D04B *23/06*
U.S. Cl. 66—84 A **14 Claims**



1. A weft thread laying apparatus for warp knitting machines having a needle bed and two spaced apart longitudinal conveyors for continuously weft threads in a given direction to the needle bed, the apparatus comprising:

first and second carriage recriprocally movable between said two longitudinal conveyors in a substantially transverse direction to the movement of said conveyors, with said second carriage spaced from said first carriage and

located intermediate said needle bed and said first carriage;

first and second thread laying guides carried on said first and second carriages, respectively, and adapted for movement in a direction relative to the direction of movement of said conveyors to lay a first and a second plurality of parallel weft threads between said conveyors;

first and second runway rails cooperating with said first and second thread laying guides, respectively, to guide the same in a given reciprocal path between said opposed conveyors;

first and second guide rails being movable relative to the direction of movement of said conveyors to cause said thread laying guides lay said plurality of first and second weft threads at an angle of 20° or greater as viewed transversely to the direction of travel of said conveyors;

a pair of displacement combs for each of said first and second thread laying guides, with each comb of said pair located outwardly adjacent each of the opposed conveyors and adapted to pick the plurality of weft threads from said thread laying guide substantially at the location where said thread guide carried by said thread carriage passes over one conveyor, reverses direction, and moves in that angular reciprocal path determined by said rail toward said other conveyor;

each comb of said pair movable in a reciprocable path parallel to said conveyors that distance necessary for said thread guide to lay successive equal widths of a given plurality of weft threads in parallel onto its respective conveyor;

whereby each of said combs can receive a given plurality of parallel weft threads from said thread guide, locate the same on the respective adjacent conveyor and then move in a direction opposite to that of the conveyor that distance necessary for said thread guide to place a successive equal width of the given plurality of parallel weft threads onto the conveyor so that all the weft threads of each of said first and second thread guides extend in parallel between said opposed conveyors, said plurality of weft threads from said first and second thread guides retained in position thereon until knitted together at the needle bed.

4,677,832

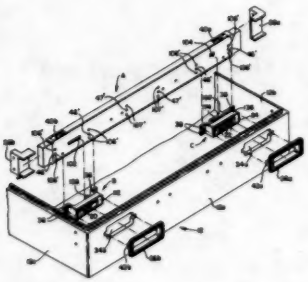
LUGGAGE LATCHING SYSTEM

Richard C. Remington, Pompton Plains, N.J., assignor to Kidde, Inc. (Presto Lock Company Division), Garfield, N.J.

Continuation of Ser. No. 524,691, Aug. 19, 1983, abandoned, which is a continuation of Ser. No. 240,848, Mar. 5, 1987, abandoned. This application Apr. 7, 1986, Ser. No. 850,073

Int. Cl.[4] E05B *65/52*

U.S. Cl. 70—67 **38 Claims**



1. A luggage article latching system including an elongate latch console comprising spaced hasp-engageable and disengageable latches, drive means for operating said latches in unison and means permitting an actuator assembly for operating said drive means to be mounted on said console selectively in alternative locations.

4,677,833

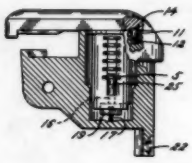
BAG LOCK

Frank J. Scherbing, deceased, late of Cook, and by F. J. Scherbing, Jr., executor, Peoria, both of Ill., assignors to Warrior Corporation, Bensenville, Ill.

Filed May 12, 1986, Ser. No. 861,929

Int. Cl.[4] E05B *67/38*

U.S. Cl. 70—68 **6 Claims**



1. In a bag zipper locking device having a lock housing and anvil with a tubular bore therein,

a rotatable keeper arm carrying a lock cylinder assembly containing resiliently biased lock tumblers,

and said keeper arm moveable between an open position transverse to the lock housing anvil and a closed position axially aligned with the lock housing anvil,

said resiliently biased lock tumblers included within the key-receiving lock cylinder assembly in said keeper arm being retractable upon insertion of the proper key into the axial keyway, the improvement comprising, in combination,

a cammed surface, upper spring-loaded detent pin in said housing which is upwardly biased against said keeper arm and, when aligned in the lock-closed position, said pin is upwardly biased into a cooperating notch in said keeper arm precluding inadvertent rotation, and

a lower detent pin contained at the bottom of the tubular bore in said lock housing which is resiliently biased into the axial keyway to block at least one of said resiliently biased lock tumblers until depressed by insertion of the proper key to permit the tumblers to be actuated for opening the lock.

4,677,834

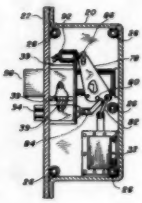
ELECTRO-MECHANICAL SECURITY LOCK

Cecil B. Hicks, 13200 Bombay St., Sylmar, Calif. 91342

Continuation-in-part of Ser. No. 763,424, Aug. 7, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 909,279

Int. Cl.[4] E05B *47/00*

U.S. Cl. 70—279 **6 Claims**



1. A security lock for architectural security systems comprising:

(a) a housing, having a faceplate on one narrow end and a

cover on one wide side, formed into a rectangular shape defining a box-like structure;

(b) a key release cylinder, having a rotatable pawl, installed through said housing cover providing a key actuated mechanism for manual operation of said lock;

(c) an electromagnetic solenoid mounted inside said housing having a linear moving plunger providing mechanical movement when electrically energized therewith;

(d) a spring loaded latchbolt having an integral roller penetrates through said faceplate in a retractable manner providing a secondary latch for said lock;

(e) a door latch assembly having a conical nosed dead lock follower within a latch barrel restrained by a plurality of round solid balls penetrates said faceplate in a retractable manner providing a latch for said lock; and,

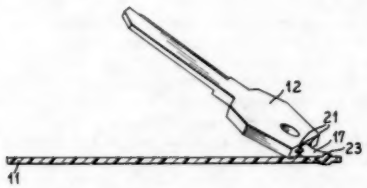
(f) connecting linkage means unites said solenoid, latchbolt, door latch and cylinder together in such a manner as to retract said latchbolt and door latch simultaneously when said solenoid is electrically energized, and also when said cylinder is rotated by said key providing a dual electrical and mechanical operation.

4,677,835

PLASTIC CARD/KEY COMBINATION AND HINGE STRUCTURE

Robert Almblad, Phoenix, Ariz., assignor to Donald Almblad, Morton Grove, Ill.

Filed Apr. 10, 1986, Ser. No. 850,155
Int. Cl.[4] A47G *29/10*
U.S. Cl. 70—456 R **20 Claims**



1. A key and card combination formed from molded plastic material and presenting a one-piece unitary molding, comprising:

a key carrying card with a key-shaped recess socket in the plane of the card;

a key separably located in the recess socket and formed in one piece with the card, and as an integral part of said molding;

and integral multidirectional hinge means comprising a unitary part of said molding and formed from the same material as the key and card and integrally connecting an edge of a head end of the key to an edge of the card in said socket and adapting the key to be swung out from and swung back into the plane of the card; and

said hinge means comprising a generally rod-shaped elongated element permitting the key to be not only swung as aforesaid, but enabling twisting of the key relative to the card on and about said hinge.

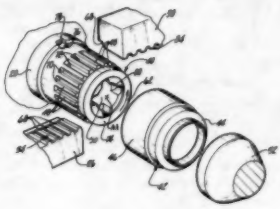
4,677,836

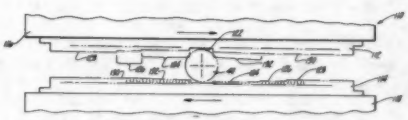
APPARATUS FOR FLANGING AND SPLINING A THIN-WALLED POWER TRANSMISSION MEMBER

Carl E. Anderson, Mt. Clemens, and James T. Killop, Warren, both of Mich., assignors to Anderson-Cook, Inc., Fraser, Mich.

Continuation-in-part of Ser. No. 626,286, Jun. 29, 1984, abandoned. This application Jun. 12, 1985, Ser. No. 747,971
Int. Cl.[4] B21H *3/06*
U.S. Cl. 72—88 **19 Claims**

1. Apparatus (**110,210**) for flanging and splining a thin-walled blank to make a splined power transmission member (**42**) comprising: a plurality of die members (**26,30**; **112,114**; **138,140**) having opposed toothed work surfaces (**34**); a toothed mandrel (**40**) positioned between the opposed work surfaces (**34**) of the dies for receiving a blank (**42**) to be splined; means for moving said die members relative to each other to cause their respective work surfaces (**34**) to move in opposite directions to perform a spline forming operation in cooperation with said mandrel; characterized by cooperating chamfering means (**68,70**) on said dies and mandrel operable during a spline forming operation for forming an outwardly projecting chamfered flange (**66**) on the blank; a loading notch (**122**) formed intermediately in each of the work surfaces (**34**), said notches (**122**)





located in opposed relationship to one another in a loading position of the die members (**112,114**; **138,140**) for receiving the mandrel (**40**) with a blank (**42**) mounted thereon prior to a spline forming operation, each of said work surfaces (**34**) having rough forming teeth (**124,126,128**) and finish forming teeth (**130,132**) located on opposite sides of said loading notch (**122**) the die members (**112,114**; **138,140**) being sequentially movable in opposed directions from the loading position to cause the rough forming teeth (**24,126,128**) to perform a rough forming operation on the blank (**42**) and then in a reverse direction to cause the finish forming teeth (**130,132**) to perform a finish forming operation on the blank (**42**).

4,677,837

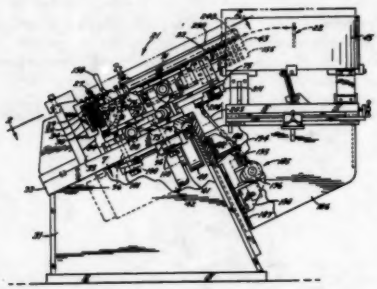
FLAT DIE THREAD ROLLER

Warren M. Jackson, Rockford, Ill., assignor to Warren M. Jackson, Inc., Rockford, Ill.

Division of Ser. No. 551,476, Nov. 14, 1983, Pat. No. 4,583,385. This application Jan. 27, 1986, Ser. No. 822,476
Int. Cl.[4] B21H *3/06*
U.S. Cl. 72—88 **6 Claims**

1. A flat die thread rolling machine comprising a support, stationary and movable dies on said support, means for reciprocating said movable die back and forth relative to said stationary die to form a thread on a fastener blank located between the dies, mechanism for feeding successive fastener blanks between said dies, a hopper for storing a supply of fastener blanks, and a pair of elongated and laterally spaced parallel rails extending between said hopper and said feeding mechanism for delivering fastener blanks forwardly from said hopper to said feeding mechanism, the improvement in said machine comprising, means mounting said hopper on said support for up and down adjustment, means mounting said rails on said support for up and down adjustment, a reversible poweroperated drive mechanism operably connected to said hopper and said rails and operable when actuated to simultaneously adjust said hopper and said rails upwardly or downwardly on said support, means for adjusting one of said rails toward and away

from the other of said rails to enable the lateral spacing between the rails to be changed, said drive mechanism having drive train means for permitting adjustment of said one rail



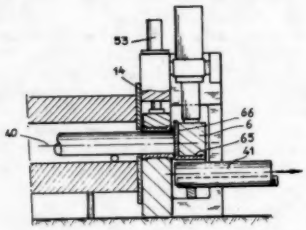
toward and away from said other rail while maintaining an operative drive to said rails for adjusting said rails upwardly and downwardly in unison.

4,677,838

INSTALLATION FOR PREPARING METAL BILLETS FOR EXTRUSION

Guy Bessey, Auvers sur Oise, and Claude Bimbert, Neiully-Plaisance, both of France, assignors to CLECIM, Courbevoie, France

Filed Dec. 10, 1985, Ser. No. 807,084
Claims priority, application France, Dec. 10, 1984, 84 18811
Int. Cl.[4] B21C *29/00*
U.S. Cl. 72—254 **4 Claims**



1. An installation for preparing metal billets to be extruded, comprising a furnace heating a metal bloom and a shear cutting the bloom into billets of a length suitable for extrusion,

(a) said furnace comprising a heating enclosure defining an elongate receptacle of a length at least equal to that of said bloom and means for pushing said bloom out of said receptacle along a longitudinal axis of movement, passing through an outlet orifice located at one end of the latter;

(b) said shear comprising connected jaws, each defining an orifice of a cross-section substantially equal to that of said bloom and centered on the axis of movement of the latter;

(c) said jaws including a pair of rear jaws mounted in a fixed frame adjacent to said furnace and at least one front jaw mounted for transverse sliding movement relative to the axis of movement of said bloom along said rear jaws on the opposite side to said furnace and associated with means for controlling the shearing of a specific length of said bloom as a result of sliding;

(d) said rear jaws being placed directly against an outlet end of said furnace in an extension of said receptacle, so as to form together with said receptacle a substantially continuous enclosure;

(e) said front jaw bing maintained in alignment with said receptacle after transverse sliding, said front jaw forming in this position a door closing said furnace between two shearing operations;

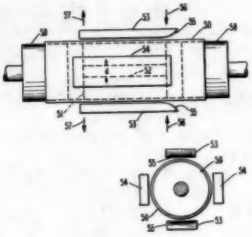
(f) a rear face part of said front jaw arranged in alignment with said receptacle after sliding being provided with a plate made of refractory material for shutting off said orifice limited by said rear jaws.

4,677,839

APPARATUS FOR SHAPING A SPIRAL CATALYST SUPPORT

William B. Retallick, West Chester, Pa., assignor to Camet, Inc., Hiram, Ohio

Division of Ser. No. 763,975, Aug. 9, 1985, Pat. No. 4,598,063.
This application Mar. 27, 1986, Ser. No. 844,607
Int. Cl.[4] B21J *13/00*; **B21D** *53/84*
U.S. Cl. 72—402 **7 Claims**



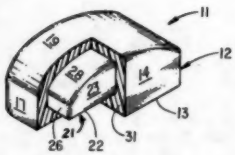
6. Apparatus for shaping a honeycomb catalyst support, the support being contained in a tube, the support including at least one strip of metal which is spirally wound on a generally cylindrical core to form a cylindrical catalyst support, the tube and the support having two ends of generally circular shape, the apparatus comprising two pairs of plates, the plates of both pairs being disposed at diametrically opposite sides of the tube, and between the ends of the tube, the plates being movable towards each other at one end of the tube and away from each other at the other end of the tube, such that movement of the plates towards the tube compresses the tube and the catalyst support contained therein, and means for moving the plates towards and away from the tube, wherein the moving means is configured such that the plates of the first pair move towards each other at the first end of the tube, while the plates of the second pair move away from each other at the first end of the tube, and wherein the plates of the second pair move towards each other at the second end of the tube, while the plates of the first pair move away from each other at the second end of the tube.

4,677,840

AUTOMOTIVE BODY TOOL

Joseph A. Kellogg, Suisun City, and James E. Prather, Fairfield, both of Calif., assignors to Non Mar, Inc., Fairfield, Calif.

Filed Jan. 14, 1986, Ser. No. 818,585
Int. Cl.[4] B21B *25/00*
U.S. Cl. 72—465 **6 Claims**



1. An automotive body tool comprising:

a. a core of iron or similar heavy material having a planar bottom, a pair of longitudinal side walls, a pair of transverse end walls and an arcuate top; and,

b. a core covering of elastomeric material having a first predetermined thickness over all surfaces of said core except the bottom, and a second predetermined thickness over the bottom, said second predetermined thickness being approximately twice said first predetermined thickness, said covering having an arcuate top, transverse end walls, longitudinal side walls and a planar bottom for face to face engagement with a planar sheet of automotive door panel material as said sheet is installed on a door framework.

4,677,841

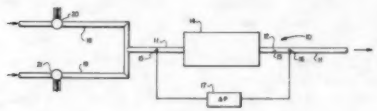
METHOD AND APPARATUS FOR MEASURING THE RELATIVE DENSITY OF GASES

Lyn R. Kennedy, Dallas, Tex., assignor to Precision Measurement, Inc., Duncanville, Tex.

Continuation of Ser. No. 597,176, Apr. 5, 1984, abandoned. This application Mar. 6, 1986, Ser. No. 836,860

Int. Cl.[4] G01N *9/26, 9/32*

U.S. Cl. 73—30 **16 Claims**



1. A method for measuring the relative density of a gas comprising:

flowing said gas under an applied pressure through an orifice or pore in a line;

measuring the pressure drop in said gas; and calculating the flow rate of said gas from said measured pressure drop;

said orifice or pore being very small relative to said line and sized with respect to the applied pressure so that deviations from ideal behavior of said flowing gas are substantially balanced by other flow effects, thus rendering an orifice discharge coefficient unnecessary in calculationg flow rate form said measured pressure drop, the square of said flow rate being inversely proportional to said relative density.

4,677,842

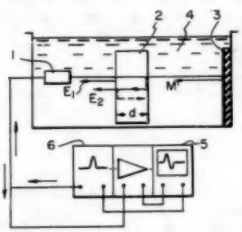
ULTRASONIC DENSITY MEASUREMENT

Luc Piché, Montreal, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 713,341, Mar. 18, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 881,972

Int. Cl.[4] G01N *9/00*

U.S. Cl. 73—32 A **6 Claims**



1. An apparatus for determining the density of a polyethylene sample comprising:

transducer means for transmitting and detecting an ultrasonic pulse having a frequency of greater than 1 MHz, an ultrasonic reflector, and means providing for immersion of the transducer means, reflector and the sample in a liquid;

means for measuring the time delays of a transmitted pulse reflected from each of the reflector, the front surface of the sample, and the rear surface of the sample; and

means for computing the velocity of ultrasound through the sample in accordance with the equation $v=c(\Delta t/2\tau+1)$ wherein c is the velocity of ultrasound in the liquid, Δt is the difference in the time delay taken with and without the sample in the liquid, 2τ is the time delay of the reflected pulse returning from the rear surface of the sample after the front surface, wherein the density is determined from a predetermined relationship of density to ultrasonic velocity.

4,677,843

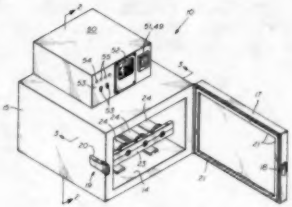
ROLLER OVEN FOR TESTING FLUIDS

Royce E. Schroeder, Spring, Tex., assignor to OFI Testing Equipment Inc., Houston, Tex.

Filed Jan. 23, 1985, Ser. No. 694,024

Int. Cl.[4] G01N *11/00, 25/00;* **F27B** *17/02;* **F27D** *21/02*

U.S. Cl. 73—54 **13 Claims**



1. An apparatus for testing fluid samples to determine the effect of temperature and various chemical additives on rheological, filtration and chemical properties under simulated circulating conditions comprising, in combination;

an enclosable emviromental chamber capable of maintaining its interior at a predetermined temperature and having a sealable door member,

a cylindrical container having an end opening with a removable cover sealed for receiving a fluid material for testing and removably positioned in said chamber,

supporting means for rotatably supporting said fluid container,

means for turning said supporting means to rotate said chamber,

heating means positioned at the bottom of said chamber underlying said supporting means for heating the interior of said chamber and said fluid,

temperature measuring means for measuring the temperature within said chamber,

temperature indicating means supported outside said chamber on the top thereof,

thermostat means positioned outside said chamber on the tip thereof and cooperative with said heating means for establishing and maintaining a predetermined temperature within said chamber, and

a housing exterior to said chamber on the top thereof enclosing said temperature indicating means and said thermostat means for easy access and visibility.

12. A method of testing fluid samples to determine the effects of temperature and chemical additives on rheological, filtration an chemical properties under simulated circulating conditions comprising the steps of;

measuring the rheological, filtration and chemical properties of said fluid sample and placing said sample into a sealed enclosure,

preheating an environmental chamber as defined in claim 1 to a predetermined temperature,

placing said sealed enclosure into said preheated environmental chamber on rotatable rollers,

rotating said rollers and said enclosure for a predetermined length of time at a predetermined temperature,

removing said enclosure from said chamber, and

measuring the change in rheological, filtration and chemical properties of said fluid sample due to the effect of the temperature and time to which said sample was subjected.

4,677,844

APPARENT VISCOSITY MEASURING APPARATUS

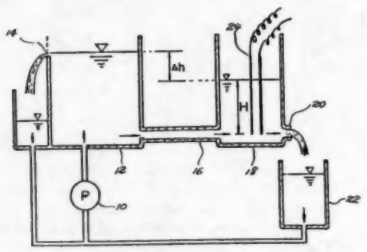
Noboru Sonoda, Ichihara, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,471

Claims priority, application Japan, Oct. 17, 1984, 59-219270

Int. Cl.[4] G01N *11/04*

U.S. Cl. 73—55 **5 Claims**



1. An apparent viscosity measuring apparatus wherein grease is pushed out under pressure through at least one capillary tube and the pressure applied to the grease during push-out is measured to thereby seek an apparent viscosity, comprising:

a cylinder, in which a piston is inserted, and lid members are provided at opposite ends thereof, respectively, whereby there are defined a first chamber for containing a test sample and a second chamber for containing hydraulic oil to push said piston;

means for feeding the hydraulic oil to said second chamber so as to push said piston toward said first chamber;

a plurality of capillary tubes each constructed such that one end thereof is secured to a first of said lid members to simultaneously provide communication between said first chamber and each of said capillary tubes, said capillary tubes each having a different inner diameter;

switching means for selectively opening a selected one of the other ends of said capillary tubes to atmosphere one after another; and

means for measuring the pressure applied to the hydraulic oil when the grease is pushed out of said capillary tube, said pressure measuring devices, each having a different measuring range to thereby facilitate the selection of an appropriate pressure measuring device corresponding to the selected capillary tube to be used for measurement.

4,677,845

DEVICE FOR DETECTING VISCOSITY OF LIQUID

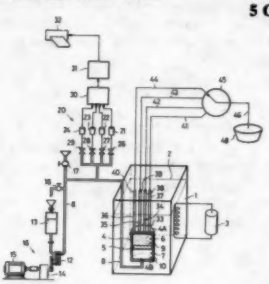
Kouji Izumi, Yokohama; Masanori Horike, Tokyo; Tatsuya Furukawa, Yokohama; Hiromichi Komai, Yokohama; Osamu Naruse, Hatano, and Yutaka Ebi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 5, 1985, Ser. No. 804,612

Claims priority, application Japan, Dec. 7, 1984, 59-259612

Int. Cl.[4] G01N *11/04*

U.S. Cl. 73—56 **5 Claims**



1. A device for detecting the viscosity of a liquid which circulated through a liquid supply system comprising:

a first tank for holding said liquid;

a supply means for supplying said liquid to said first tank;

a height regulator means coupled to said supply means for maintaining at a predetermined height said held liquid;

a second tank;

a conduit coupling said first and second tanks below the level of said held liquid for transferring said liquid from said first tank to said second tank;

an orifice in said second tank for providing an outflow of said liquid;

sensor means placed in said second tank and in direct contact with said liquid contained therein for sensing the height of said liquid in said second tank;

viscosity detecting means coupled to said sensor for calculating the viscosity of said liquid in response to the output of said sensor.

4,677,846

METHOD OF MEASURING AND REGULATING THE CONCENTRATION OF A FIBRE SUSPENSION AND A DEVICE FOR CARRYING OUT THE METHOD

Peter Lundberg, Åmål, Sweden, assignor to Eur-Control Kalle AB, Sweden

PCT No. PCT/SE85/00166, § 371 Date Nov. 27, 1985, § 102(e) Date Nov. 27, 1985, PCT Pub. No. WO85/04716, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 9, 1985, Ser. No. 829,123

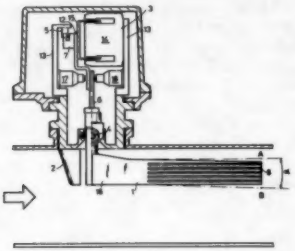
Claims priority, application Sweden, Apr. 6, 1984, 8401950

Int. Cl.[4] G01N *11/00*

U.S. Cl. 73—63 **9 Claims**

1. A method of measuring and regulating the concentration of a fibre suspension, with aid of a blade (1) pivotally suspended in the suspension, said blade being caused to pivot such that its free of trailing edge (8) moves between two end positions (A-B) in the suspension to provide a predetermined angular stroke (α), wherein the blade (1) pivots intermittently and with a constant force, at least in the measuring direction in the suspension, between both end positions (A and B) witha stroke exceeding 1 mm at the trailing edge (8) of the blade (1), time measurement being carried out when the trailing edge (8) moves through a 50–80% portion of the angular stroke (α), said portion being situated at an equal distance from the upper end position (A) and lower end position (B) of the stroke (α), said time having a value which is a parabolic function of the

concentration and varying in response to the shear force resistance in the fibre suspension of the blade (1) during its angular



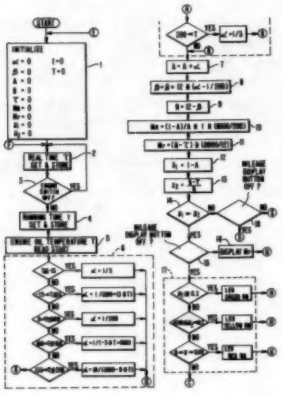
stroke, and thus in response to the concentration of solid substances in the suspension.

4,677,847

AUTOMOTIVE ENGINE OIL MONITORING SYSTEM

Takeo Sawatari, Birmingham; Mitsutaka Nakamura, Farmington Hills, and Toshihiro Sugiura, Birmingham, all of Mich., assignors to Aisin Seiki Kabushiki Kaisha, Asahi, Japan

Filed Sep. 30, 1985, Ser. No. 781,501
Int. Cl.[4] G01N *33/28*
U.S. Cl. 73—64 **8 Claims**



7. A system for continuously monitoring and indicating engine oil deterioration during the period of the oil's useful life in an internal combustion engine comprising:

temperature signal generating means for generating a signal representative of engine oil temperature;

deterioration rate measuring means coupled to said temperature signal generating means for determining the rate of deterioration of said oil as a function of oil temperature;

engine running time measuring means for generating a signal representative of elapsed engine running time;

time measuring means for generating a signal representative of actual elapsed time since the oil was changed;

a first remaining useful life determining means coupled to said deterioration rate determining means and said engine running time measuring means for determining the first remaining useful life (M_R) in accordance with the following expression:

$$M_R = \frac{1 - A}{A} \times t \times M,$$

where

$$A = \int_0^t \alpha\,(T)dt;$$

t=elapsed engine running time

T=oil temperature

α=oil deterioration rate

M=a constant representative of average mileage of an automobile in miles/hour,

and producing a continuous output signal representative of said first remaining useful life;

a second remaining useful life determining means coupled to said deterioration rate determining means and said time measuring means for determining the second remaining useful life of said oil as a function of said deterioration rate and said actual elapsed time and producing a continuous output signal representative of said second remaining useful life;

signal selecting means for selecting either the output signal from the first remaining useful life determining means or the output signal from the second remaining useful life deterining means; and

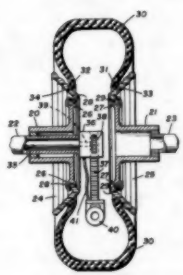
indicating means coupled to said remaining useful life determining means for indicating the remaining useful life as a function of the selected output signal.

4,677,848

MULTI-SIZE TIRE CHUCK

Thomas A. Flory, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 2, 1985, Ser. No. 803,755
Int. Cl.[4] G01M *17/02*
U.S. Cl. 73—146 **5 Claims**



1. A device for holding a pneumatic tire under internal inflation pressure comprising two opposing frusto-conical members

(A) made from a deformable, semi-rigid material relatively transparent to, and not easily degraded by, x-rays, and

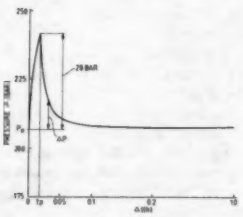
(B) having a plurality of stepped ridges shaped to fit the axially outer portion of a tire bead and sized to accommodate a plurality of standard bead diameters, said device also including means holding the members in a spaced, opposing position relative to each other, said means mounted for rotation about the central axes of the members.

4,677,849

HYDROCARBON WELL TEST METHOD

Joseph Ayoub, Lafayette, La., and Dominique Bourdet, Vaux-le-Pénil, France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 19, 1985, Ser. No. 767,216
Claims priority, application France, Aug. 29, 1984, 84 13359
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—155 3 Claims



1. A well test method for determining the physical characteristics of a system consisting of a well and of a subsurface formation a system consisting of a well and of a subsurface formation containing a fluid such as a hydrocarbon and communicating with said well, wherein the formation is homogeneous or heterogeneous and exhibits the skin effect and/or the wellbore storage effect, comprising changing the flow rate of said fluid and measuring a characteristic parameter of the pressure P of the fluid at successive time intervals Δt, the change of flow rate being carried out in a short period so as to obtain a flow pulse resembling a Dirac pulse, with the amplitude of said flow pulse being sufficiently high to allow the measurement of said characteristic parameter of the pressure P of the fluid at said successive time intervals Δt, and being characterized in that one also measures the variations in the pressure P of the fluid during said short period, then during the subsequent period of return to the initial state of the well-formation system, and one compares the experimental pressure curve thus obtained with the curves of a double network of type curves representing, as a function of a common parameter, the pressure P and its derivative P′ with respect to time, by matching the branch of the experimental curve corresponding to the short period with a curve P and the branch of this curve corresponding to the subsequent period with the curve P′ of the same parameter.

4,677,850

SEMICONDUCTOR-TYPE FLOW RATE DETECTING APPARATUS

Kazuhiko Miura, Kaichi; Tadashi Hattori; Yukio Iwasaki, both of Okazaki; Tokio Kohama, Nishio, and Kenji Kanehara, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 579,075, Feb. 10, 1984, abandoned. This application Mar. 21, 1986, Ser. No. 843,922
Claims priority, application Japan, Feb. 11, 1983, 58-20842; May 10, 1983, 58-82418; Jun. 20, 1983, 58-110398; Jun. 23, 1983, 58-113977
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 15 Claims

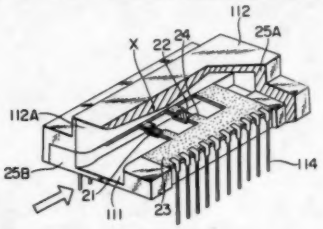
1. A semiconductor-type apparatus for detecting a fluid flow rate comprising:

a casing having a communicated portion arranged in a flow path of the fluid;

at least one insulating base provided in said casing and having a cut-out portion formed at the communicated portion of said casing;

a first rectangular thin plate semiconductor chip having its long sides sufficiently longer than its short sides and arranged in said cut-out portion supported by said insulating base at both short sides so that the long sides are perpendicular to a direction of fluid flow and both surfaces of said first semiconductor chip are substantially in parallel with the direction of fluid flow and having a first temperature detecting element formed on the surface of said first semiconductor chip having a maximum area so that the surface having said first temperature detecting element is parallel with the direction of fluid flow, and both surfaces of said first semiconductor chip are exposed to the fluid flow; and

a second rectangular thin plate semiconductor chip having its long sides sufficiently longer than its short sides, positioned in proximity to said first semiconductor chip and arranged in said cut-out portion supported by said insulating base at both short sides of said second semiconductor chip so that the long sides thereof are perpendicular to the direction of fluid flow and both surfaces of said second semiconductor chip are substantially parallel with the direction of fluid flow and having a heater element and a second temperature detecting element formed on the surface of said second semiconductor chip having a maximum area so that said heater element is formed at substantially the center with respect to the long sides of said second semiconductor chip and so that the surface on which said heater element and said second temperature detecting element are formed is also parallel with the direction of fluid flow, and both surfaces of said second semiconductor chip are exposed to the fluid flow.



4,677,851

METHOD AND APPARATUS FOR MONITORING THE DENSITY OF A LIQUID

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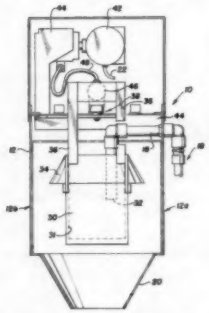
Filed Feb. 10, 1986, Ser. No. 827,511
Int. Cl.[4] G01N *9/04*
U.S. Cl. 73—434 21 Claims



1. A method of continually monitoring the density of a liquid, comprising the steps of:

(a) continually obtaining samples of the liquid;

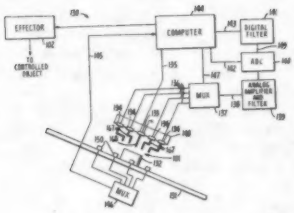
(b) flowing the samples into a container having a closed bottom and sides;
(c) overflowing the container so as to maintain a fixed predetermined volume of the liquid samples within the container;
(d) supporting the container and liquid samples on at least one bed of pressurized lfuid; and
(e) varying the pressure of the fluid as a function of the weight of the container and liquid to produce a signal representative of the density of the liquid.

4,677,852

METHOD OF AND APPARATUS FOR INSPECTING AND/OR POSITIONING OBJECTS WITH WAVE ENERGY USING WAVE GUIDES

James A. Pinyan, Sunnyvale, and B. Shawn Buckley, San Jose, both of Calif., assignors to Cochlea Corporation, San Jose, Calif.

Filed Sep. 27, 1985, Ser. No. 781,259
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—628 **28 Claims**



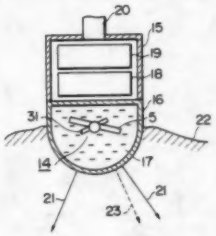
1. Apparatus for achieving at least one of inspecting and positioning of an object, that comprises:
an array adapted to generate continuous wave energy of a single frequency, to transmit the wave energy to an interaction region where it interacts with the object, said array including a plurality of waveguides to transmit the energy in both directions to and from the objects and further including sensor means comprising a multiplicity of spaced-apart sensors disposed to receive said wave energy at a multiplicity of places after interaction with the object, said sensor means being adapted to produce electric signals representative of the received wave energy, said array comprising a transducer to generate said continuous wave energy which is transmitted by a waveguide of the plurality of waveguides to the interaction region, said array comprising a coupling volume to achieve enhanced coupling between the waveguides and the transducer and the sensor means;
means for processing the electric signals into at least one of amplitude and phase information for each sensor of the sensor means; and
means for analyzing said at least one of amplitude and phase information from each sensor of the multiplicity of sensors into at least one of a geometric characteristic and an electromagnetic characteristic of the object.

4,677,853

ULTRASONIC PROBE

Masami Kawabuchi, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 23, 1986, Ser. No. 854,784
Claims priority, application Japan, Apr. 26, 1985, 60-90021
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—644 **19 Claims**



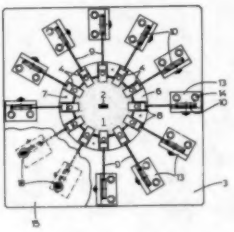
1. An ultrasonic probe comprising:
a first rotatable composite oscillator which includes first and second oscillators having inherent center frequencies different from each other, said first and second oscillators being disposed back-to-back; and
a second rotatable, frame-shaped composite oscillator which is disposed around said first composite oscillator and includes third and fourth oscillators having inherent center frequencies different from each other, said third and fourth oscillators being disposed back-to-back.

4,677,854

TEST DEVICE FOR PRODUCING A BIAXIAL STATE OF TENSION

Antonio Gabelli, Ijsselstein, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Netherlands

Filed Jan. 6, 1986, Ser. No. 816,429
Claims priority, application Netherlands, Jan. 22, 1985, 8500151
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—794 **4 Claims**



1. Apparatus for producing a biaxial state of tension in a flat body (1) in the form of a thin test specimen made of an elastic material comprising a plurality of clamping members (4) adapted to be detachably secured to the periphery of the test body, a drawplate (15), means connecting the clamping members to the drawplate including force transmitters in the form of cables, each cable connected at one end to a clamping member (4) and at its opposite end by adjustable and removable means to the drawplate, rerouting wheels (10) directing the cables (9) from the drawplate to the clamps to thereby distribute a uniaxial force on the drawplate uniformly to the clamping members via the rerouting wheels and a plurality of aligning members (6) for removably receiving the clamping members to

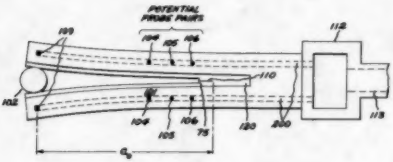
provide means for accurately positioning the clamping members on the periphery of the test body.

4,677,855

METHOD FOR MEASURING DAMAGE TO STRUCTURAL COMPONENTS

Louis F. Coffin, Jr., and Thomas A. Prater, both of Schenectady, N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 19, 1985, Ser. No. 810,628
Int. Cl.[4] G01N *19/00*
U.S. Cl. 73—799 **14 Claims**



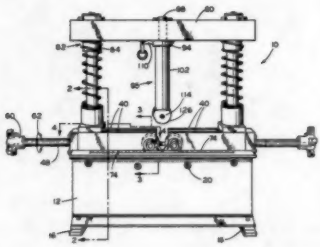
1. A method for measuring crack growth within a solid having a preformed crack and a crack mouth which comprises the steps of applying a current to the solid to produce a potential field within said solid, measuring the voltage across the crack by at least two pairs of proves positioned at up to 99% of the preformed crack depth measured from the mouth of the crack, the two probes from each pair of probes being positioned on opposite sides of the crack at an equivalent distance from the mouth of the crack; approximating a straight line with average values for the measured voltage across each pair of probes versus the average distance of said pair of probes from the mouth of the crack, calculating the distance intercept of said straight line at the axis where voltage=0, and monitoring the changes in value for the intercept over time to determine the change in crack depth.

4,677,856

GUIDED-BEND TEST APPARATUS

Glenn N. Fischer, c/o Fischer Engineering Company 7595 E. Singer Rd., Dayton, Ohio 45424

Filed Apr. 14, 1986, Ser. No. 851,199
Int. Cl.[4] G01N *3/20*
U.S. Cl. 73—850 **11 Claims**



1. Apparatus for testing the ductility of a weld located within an elongated specimen, said apparatus for use with a device having a ram supported for raising and lowering over a bed, said apparatus comprising:

a base defining an upper surface having a central opening;

a pair of rollers, each of said rollers having a pair of ends and a width sufficient for supporting the specimen, each of said rollers further being supported at said ends by said base to extend over said opening;

a beam;

at least two upright supports mounted to said base to extend upwardly therefrom;

said beam being fitted onto said upright supports to be freely vertically slidable thereon;

stop means for preventing vertical upward movement of said beam on said upright supports beyond a predetermined height above said base;

spring means connected between said base and said beam for biasing said beam upwardly against said stop means; and

a downwardly extending mandrel connected to said beam, said mandrel defining at its lower end a working surface;

said mandrel having a length and being located, when said beam is biased upwardly against said stop means, with said working surface above but between said rollers;

whereby said base may be placed on the bed, the specimen may be positioned upon said rollers with the weld disposed equidistant between said rollers, said mandrel may be contacted by the ram for applying downward force by the ram, and whereby said mandrel may be forced downwardly by the ram to cause said mandrel to contact the specimen along said working surface to bend the specimen into said opening; and

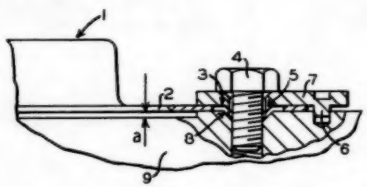
whereby upon subsequent upward movement of the ram, said spring means forces said beam upwardly against said stop means.

4,677,857

FASTENER ARRANGEMENT FOR DEFORMATION SENSOR

Joachim Feldmann, Neustadt, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 28, 1985, Ser. No. 791,674
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1984, 3441127; Jun. 28, 1985, 3523168
Int. Cl.[4] G01L *1/26;* F16B *29/00*
U.S. Cl. 73—855 **24 Claims**



13. A fastener arrangement for fastening a first member to a second member by at least one screw which is screw-threaded into said second member comprising:

(a) said first member being deformable in at least one contact area thereof with said second member;

(b) screw support means interposed between said screw and said first member so as to be nonrotatable for isolating from said first member the turning moments imparted by said at least one screw during tightening thereof;

(c) said second member and said screw support means having die and counter-die formations in their portions adjacent said at least one contact area; and

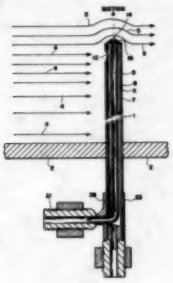
(d) said at least one contact area of said first member being pressed into a shape conforming to said die and counter-die formations during said tightening of said at least one screw, to provide in said at least one contact area a form-fit connection by which said first member is fastened to said second member.

4,677,858

DOUBLE-ACTING PITOT TUBE

Buford U. Ohnhaus, 9925 Lorelei Lane NE., Albuquerque, N. Mex. 87111

Filed Mar. 13, 1986, Ser. No. 839,424
Int. Cl.[4] G01F 1/46
U.S. Cl. 73—861.65 18 Claims



1. Double-acting differential fluid pressure measuring device for measuring fluid flow, comprising:

a dual-channel elongate duct equipped for mounting in a position transverse to the direction of flow of a fluid medium into which a portion of said duct, including a first end thereof, projects when mounted in said position, said mounted position defining an upstream side of said portion of said duct, said duct having a first channel, having straight end portion, for measuring a pressure lower than the static pressure of said medium when there is a flow of said medium in said direction and a second channel for measuring a pressure higher than the static pressure of said medium when there is a flow of said medium in said direction;

a first orifice at said first end of said duct providing an open end for said straight end portion of said first channel facing perpendicularly to said direction of flow and terminating in a plane perpendicular to said straight end portion of said first channel, for passage of said fluid medium into and out of said first channel, said first orifice being provided with a fluid-deflecting rim surrounding said first orifice having a surface inclined to said plane perpendicular to said straight end portion of said first channel, said inclined surface having a central profile, in said direction of flow, inclined at an angle to said plane, averaged along said profile leading away from said plane to the outer periphery of said surface which is in the range from 15° to 45°;

a second orifice on said upstream side of said duct near said first end thereof for permitting passage of said fluid medium into and out of said second channel;

means at and near a second end of said duct, oppositely located relative to said first end, for connecting said first channel of said duct to the low-pressure sensing connection of a differential manometer having high and low pressure sensing connections and for connecting said second channel of said duct to the high pressure sensing connection of said differential manometer;

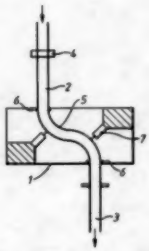
whereby said manometer, by virtue of the position of said first orifice and the configuration and extent of said rim, measures a pressure difference representative of the rate of said flow which difference is at least 25% greater than the difference between the pressure at said high pressure sensing connection of said manometer and the static pressure of said medium in the region of the measure flow.

4,677,859

FLOW METER

David Chinery, Hayes, England, assignor to The British Petroleum Company, p.l.c., London, England

Filed Jul. 22, 1985, Ser. No. 757,469
Claims priority, application United Kingdom, Aug. 4, 1984, 8420882
Int. Cl.[4] G01F 1/78
U.S. Cl. 73—861.72 8 Claims



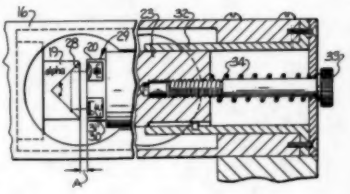
1. Flow meter comprising a housing having an inlet and an outlet for a fluid, a flow tube located within the housing and allowing fluid from the inlet to the outlet, the flow tube having an S bend geometry comprising a pair of symmetrical bends, one in a first direction and another in an opposite direction, each of said bends having a midpoint, the ends of the flow tube being slightly spaced apart from the respective housing inlet and outlet to enable fluidic communication between the flow tube and the housing, the flow tube being rigidly mounted on means for measuring the reaction forces generated by fluid flow through the flow tube, and said means being disposed normal to the midpoints in the bends of the flow tube.

4,677,860

YARN TENSION SENSOR

Bernd Wessolowski, Remscheid, and Wilfried Mink, Wuppertal-Ronsdorf, both of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,906
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506897; Jun. 21, 1985, 3522239
Int. Cl.[4] G01L 5/10, 25/00
U.S. Cl. 73—862.48 27 Claims



1. A yarn tension sensor adapted for use with a textile yarn processing machine and comprising

an elongate spring arm having one end adapted to be fixedly mounted to a textile yarn processing machine and an opposite free end which is deflectable in a predetermined deflecting direction with respect to said machine,

guide surface means mounted to the free end of said arm for engaging a running yarn, and such that the tension in the running yarn acts to deflect the free end of said spring arm in said deflecting direction, and

means for damping the deflecting movement of said free end of said spring arm, said damping means including a recep-

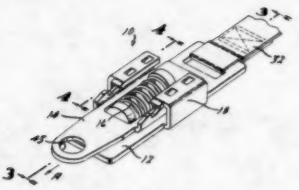
tacle supporting a magnetic fluid, and with said spring arm having a portion thereof immersed in said magnetic fluid.

4,677,861

FORCE RECORDING SEAT BELT ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Sep. 16, 1985, Ser. No. 776,643
Int. Cl.[4] G01D *1/12, 21/02;* G04E *7/00*
U.S. Cl. 73—862.54 24 Claims



1. A safety belt assembly for measuring the force exerted on the assembly, the assembly comprising:

a first and second member;

means associated with said first and second members for providing incremental movement of said members with respect to one another the amount of incremental movement enabling a measurement of said force;

a resilient biasing means in communication with said members for maintaining said members in a first relaxed position when no force is exerted, said biasing means resiliently restraining said incremental movement of said members when said force is exerted;

means on at least one of said members for securing said assembly into a buckle; and

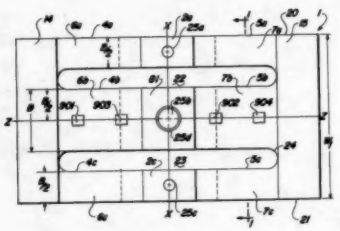
means on at least one of said members for securing said assembly onto a belt.

4,677,862

EXTRUDED LOAD CELL

Seymour H. Raskin, P.O. Box 913, Rockwall, Tex. 75087

Continuation of Ser. No. 543,247, Oct. 19, 1983, abandoned, Continuation-in-part of Ser. No. 202,460, Oct. 31, 1980, Pat. No. 4,420,985, which is a division of Ser. No. 37,133, May 8, 1979, abandoned. This application Sep. 24, 1986, Ser. No. 912,156
Int. Cl.[4] G01L *1/22*
U.S. Cl. 73—862.65 20 Claims



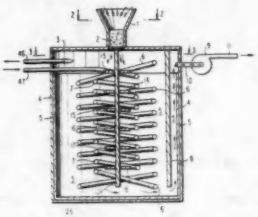
1. In a force sensitive structural element, a pair of parallel side faces spaced apart by a desired width such that said width includes the width of one middle portion, the width of two side portions and the width of two slots, whereby the width of each of said side portions is equal to one-half the width of said middle portion; a pair of mounting holes in said side portions and a load securing hole in said middle portion; a center post stem extending through said load securing hole, said center post stem having threads at its lower end; a center post cap on said stem; a center post nut secured to the said threads; and welds disposed within the internally threaded portion of said nut at an elevation coincidental with the lower end surface of the said stem, so that any shrinkage of said weld tends to pull said stem deeper into said nut.

4,677,863

SUB-MICRON PARTICLE SAMPLER APPARATUS

Don D. Gay, Aiken, and William G. McMillan, Ulmers, both of S.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 599,292, Apr. 12, 1984, Pat. No. 4,530,250.
This application Mar. 25, 1985, Ser. No. 715,319
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[4] B01D *50/00, 47/05*
U.S. Cl. 73—863.12 11 Claims



1. An apparatus for sampling sub-micron sized particles contained in a carrier gas sample, comprising:

a collection chamber defining a volume and having sample gas inlet and outlet means;

means for filtering a sample gas prior to said sample gas entering said collection chamber, said filtering means removing from said sample gas large particles having a diameter of at least about 0.3 microns;

means in said collection chamber for removing small particles from said sample gas, said small particles having a diameter of less than about 0.3 microns, said removing means including means for cooling said sample gas to a temperature at which moisture in said sample gas is frozen, said small particles being trapped in said frozen moisture;

means for removing said small particles from said collection chamber; and

means for concentrating and collecting said small particles from said frozen moisture to provide a sample for subsequent analysis.

4,677,864

SYSTEM FOR AUTOMATIC SAMPLING AND SAMPLE CONVEYANCE FOR ANALYSIS

Nikolai N. Gluschenko; Vladislav V. Golikov, and Viktor A. Emelyanov, all of Sverdlovsk, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Konstruktorsky Institut Tsvetmetavtomatika, Sverdlovsk, U.S.S.R.

Filed Oct. 17, 1985, Ser. No. 788,469
Claims priority, application U.S.S.R., Apr. 6, 1981, 3272538
Int. Cl.[4] G01N *1/20, 1/14*
U.S. Cl. 73—863.51 1 Claim

1. A system for automatic sampling and sample conveyance for analysis, comprising:

a sampler having a slurry sampling member;

a flexible hose having two ends and designed for draining slurry from said slurry sampling member;

a metering receptacle having a sample inlet, a compressed air inlet, and an outlet;

said flexible hose having one said end thereof connected to

said slurry sampling member and said other end connected to said slurry inlet of said metering receptacle;

a water supply line connected to another inlet of said metering receptacle;

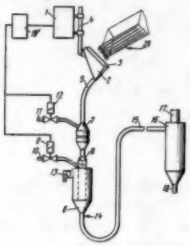
a chamber for accumulation and dispatch of samples having an inlet for the admission of slurry and compressed air, a first outlet for dispatching slurry, and a second outlet for draining an excess of water;

a first check valve mounted at said inlet of said chamber for accumulation and dispatch of samples;

a second check valve mounted at said second outlet of said chamber for accumulation and dispatch of samples;

said metering receptacle being connected to said first inlet of said chamber for accumulation and dispatch of samples through said first check valve;

a compressed air supply line connected to said inlet of said chamber for accumulation and dispatch of samples through a first controlled valve;



an additional controlled valve mounted between said water inlet of said metering receptacle and said water supply line;

a conveying line for conveying samples, having two ends,

a sample receiver having an inlet for receiving slurry;

said conveying line having one said end thereof connected to said first outlet of the chamber for accumulation and dispatch of samples and the other said end thereof connected to said inlet sample receiver;

a command device having two outputs;

one said output of the command device being electrically connected to said sampler;

said other output of the command device being connected to said controlled valves;

said controlled valves being connected in parallel with each other;

capacities of said metering receptacle and said chamber for accumulation and dispatch of samples being about equal to each other.

4,677,865

PIPE PIG WITH RUNNING GEAR

Peter Lehmann, Hilden, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,778

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419683

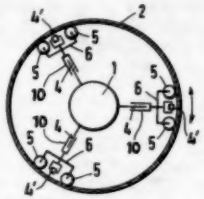
Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—866.5 **13 Claims**

1. A pipe pig for axial movement in a pipe line comprising:

a main body having a longitudinal axis;

at least two runners extending outwardly from said main body for supporting said main body on an inside surface of a pipe line, said at least two runners being disposed at different locations around the longitudinal axis of said main body, said at least two runners comprising means for contacting the inner surface of the pipe line for axial movement therein and for driving said runners in rotation about said longitudinal axis of said main body to any angular position about said longitudinal axis with respect to the pipe line, said at least two runners supporting said main body at all said angular positions, wherein said runners extend outwardly from said main body in directions



substantially radial with respect to said longitudinal axis, and wherein at least one of said runners can rotate about an axis thereof normal to said longitudinal axis and oriented in said substantially radial direction; and

means on said pipe pig for detecting the axial and angular positions of the pipe pig within the pipe line.

4,677,866

COUPLING SYSTEM AND DOUBLE SHAFT TRANSMISSION STRUCTURE FOR AN ARGICULTURAL TRACTOR

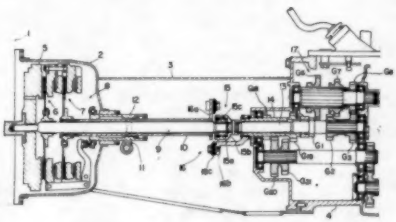
Masatsugu Tone, Hashimoto, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Oct. 21, 1985, Ser. No. 789,767

Claims priority, application Japan, Mar. 1, 1985, 60-30096[U]; Mar. 18, 1985, 60-39596[U]; Mar. 20, 1985, 60-40001[U]

Int. Cl.[4] F16H *37/00*

U.S. Cl. 74—15.86 **5 Claims**



1. A transmission structure for an agricultural tractor having an engine and a double clutch mechanism including a propelling system clutch and a power takeoff system clutch operable in sequence, an inner and outer double shaft construction extending from the double clutch mechanism and including a propelling system drive shaft and a power takeoff system drive shaft surrounding said propelling system drive shaft, a gear transmission case, a propelling system gear transmission housed in said gear transmission case for receiving the output of the propelling system drive shaft, and a power takeoff system gear transmission housed in the gear transmission case for receiving the output of the power takeoff system drive shaft, said transmission structure comprising:

a clutch housing adapted to be directly connected to the engine and containing,

a transmission housing formed of sheet metal and interconnecting the clutch housing and the gear transmission case,

a propelling system input shaft supported by the gear transmission case,

a power take off system input shaft supported by the gear transmission case and surrounding said propelling system

input shaft so as to provide an inner and outer double shaft construction,

a ball coupling interconnecting the propelling system drive shaft and the propelling system input shaft which are inner shafts of the double shaft construction in the transmission housing, and

a flange type elastic coupling interconnecting the power takeoff system drive shaft and the power takeoff system input shaft which are outer shafts of the double shaft construction in the transmission housing.

4,677,867

POWER CHANGE-OVER MECHANISM OF A VEHICLE FOR INDUSTRIAL MACHINERY

Noritaka Sumihi, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

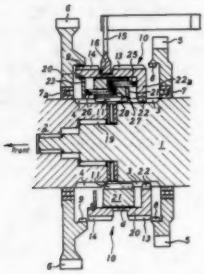
Filed Mar. 22, 1985, Ser. No. 714,749

Claims priority, application Japan, Mar. 23, 1984, 59-42622[U]

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.[4] F16H *3/08*

U.S. Cl. 74—332 **3 Claims**



1. A power changeover mechanism of a vehicle for industrial machinery comprising:

a. a first driving shaft and a high-speed gear mounted for rotation thereon;

b. a second driving shaft disposed in coaxial arrangement with said first driving shaft and having a low speed gear mounted for rotation thereon;

c. splines formed in both said shafts and both said gears;

d. a power change-over annular spool disposed between said gears freely slidingly operable in an axial direction from a two-wheel drive position to a four-wheel drive position;

e. said spool being divided into two members; an outer peripheral member having a cylindrical portion with exterior splines for freely meshing with said gears and a radially inwardly extending flange at one end of said cylindrical portion with an interior sub-spline constantly meshing with the spline of the first driving shaft and adapted for axial movement between said two-wheel drive position and said four-wheel drive position;

f. said outer peripheral member being disposed around an internal peripheral side member with an annular clearance between said members;

g. said outer peripheral member also having an annular washer on its inner peripheral surface held against axial movement to prevent said washer from moving in a direction away from said flange portion;

h. said inner and outer peripheral member being movably connected to each other in the axial direction through a damper means.

4,677,868

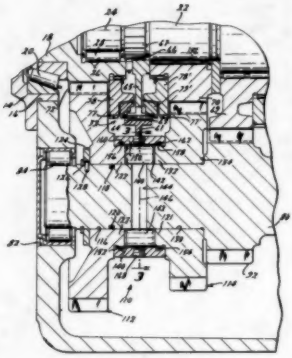
TRANSMISSION VIBRATION VISCOUS DAMPER

Timothy J. Filkins, Elbridge, N.Y., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 10, 1986, Ser. No. 850,184

Int. Cl.[4] F16H *3/08, 55/14;* F16D *3/80*

U.S. Cl. 74—359 **9 Claims**

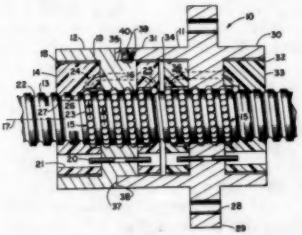


1. A manual transmission comprising an input shaft adapted to be clutched to the crankshaft of an internal combustion engine, said input shaft having an input gear integral therewith; said input gear formed with peripheral teeth and having a concentric axial bore formed as an integral part of said input shaft; a transmission output shaft supported at its forward end by journal means located in said axial bore, said output shaft having a speed gear formed with peripheral teeth journalled thereon, a countershaft having an axis of rotation parallel with the axis of rotation of said output shaft, the improvement wherein said countershaft having a viscous fluid damper coupling supported thereon, said coupling comprising a first driven gear journalled on said countershaft, said first driven gear having peripheral teeth in constant meshed engagement with said input gear peripheral teeth, a second driven gear fixed on said countershaft for rotation therewith, said second driven gear having peripheral teeth in constant meshed engagement with said speed gear peripheral teeth, a diametrical through bore extending through said countershaft intermediate said first and second driven gears, each said first and second driven gears formed with a set of longitudinally extending mirror image axial teeth arranged concentrically about said axis of rotation, said sets of axial teeth being sized to mesh in a loose fitting manner defining predetermined interconnected clearance spaces between said sets of axial teeth, said spaces being in communication with said through-bore and providing limited freedom of rotary movement of said first driven gear relative to said countershaft and said second driven gear, a hollow sleeve concentrically surrounding said sets of axial teeth, means sealing said sleeve to associated portions of said driven gears while allowing relative rotary movement between said sleeve and said first driven gear, means sealing said first driven gear to said countershaft whereby said sleeve and said first and second driven gears providing a sealed viscous fluid chamber comprising said through-bore and said interconnected spaces between said loosely mating axial teeth, clutch means for selectively connecting said speed gear in driving engagement with said output shaft, wherein upon said clutch means connecting said speed gear in driving engagement with said output shaft, the viscous fluid in said chamber providing a dampening medium substantially obviating the transfer of torsional vibrations from said input shaft to said countershaft and thus to said output shaft speed gear.

4,677,869
LINEAR ACTUATOR

Ralph W. Mayfield, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 25, 1985, Ser. No. 801,667
Int. Cl.[4] F16H *1/18*
U.S. Cl. 74—424.8 R **3 Claims**



1. In a linear actuator having: a ball screw with a helical ball screw groove; a ball nut with a corresponding helical ball nut groove; a plurality of balls arrayed in an endless ball circuit extending along said ball nut groove, out of the opposite ends of said ball nut, and through a ball nut hole extending between said opposite ends of said ball nut; an improved nut closure device located proximate to at least one of said ball nut ends, wherein the improvement comprises:

a closure body;

a ball guide portion in said closure body extending for appoximately one revolution of said endless ball circuit around said ball screw;

a non-linear closure ball passage formed in said closure body, said non-linear closure ball passage having:

a first portion communicating with said ball guide portion and oriented substantially tangent to said ball screw groove; and

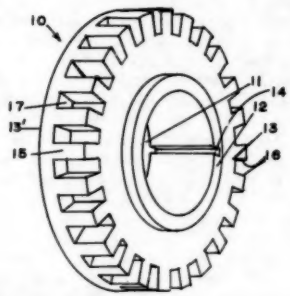
a second portion parallel to the longitudinal axis of said ball screw and blending into said first portion; and

means for preventing relative rotation between said closure body and said ball nut in assembly while said closure ball passage and said ball nut hole are in alignment.

4,677,870
FORGED SPUR GEAR WITH WEB CONNECTED TEETH

Ebrahaem Alshareedah, P.O. Box 16155, Qudessiah, Kuwait

Filed Sep. 30, 1985, Ser. No. 781,484
Int. Cl.[4] F16H *55/06*
U.S. Cl. 74—431 **2 Claims**

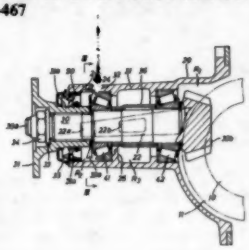


1. A forged steel spur gear having constant pitch diameter radial teeth disposed parallel to the gear axis and configured with a lateral face extremity portion extending as a continuous web integral with gear teeth from the root of said teeth to substantially the addendum circle at one lateral face only of said gear, enabling said gear to be removed from forging dies in conventional manner, the forged metal of said gear being densified and refined throughout and of greater strength and resilence than as-cast metal.

4,677,871
LUBRICATION MECHANISM IN FINAL DRIVE AND DIFFERENTIAL UNIT

Kiyoshi Taniyama, and Hiroshi Hori, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 1, 1985, Ser. No. 750,309
Claims priority, application Japan, Jul. 6, 1984, 59-102634[U]
Int. Cl.[4] F16H *57/04*; F01M *1/00*
U.S. Cl. 74—467 **5 Claims**



1. In a final drive and differential unit for a motor vehicle comprising a differential carrier integrally formed with a cylindrical support structure and arranged to store an amount of lubricating oil therein, a differential gear unit rotatably mounted within said carrier, a ring gear contained within said carrier and mounted on said differential gear unit for rotation therewith, and a drive pinion shaft supported by a pair of axially spaced outside and inside bearings mounted within said cylindrical support structure, said drive pinion shaft extending outwardly through an annular oil seal member mounted within an outer end portion of said cylindrical support structure and having an inner end integral with a drive pinion in mesh with said ring gear, wherein said cylindrical support structure has first and second side walls located at respective sides of said pinion shaft, said first side wall being formed therein with an oil supply passage having one end in open communication with the interior of said carrier for receiving lubricating oil picked up by said ring gear and another end in open communication with an annular space around said drive pinion shaft between said oil seal member and said outside bearing, and said second side wall being formed therein with an oil return passage having one end in open communication with the interior of said carrier and another end in open communication with the annular space around said drive pinion shaft,

the improvement wherein said cylindrical support structure is formed at an inner wall thereof with a recessed portion which is located above the annular space around said drive pinion shaft and includes a guide surface inclined with respect to said drive opinion shaft and directed toward an upper portion of said oil seal member, and wherein an impeller member is mounted on said drive pinion shaft for rotation therewith and arranged to pick up lubricating oil stored in the annular space around said drive pinion shaft and carry it toward the recessed portion in said cylindrical support structure.

4,677,872

METHOD OF FITTING GRIP OVER HANDLEBAR AND GRIP USED IN CARRYING THE METHOD INTO PRACTICE

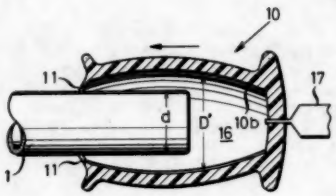
Hiroshi Nishida, Miki, and Takemi Inoue, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jul. 31, 1985, Ser. No. 760,763

Claims priority, application Japan, Jul. 31, 1984, 59-117686[U]

Int. Cl.[4] B62K *21/26*

U.S. Cl. 74—551.9 **3 Claims**



1. A method of fitting a grip over a handle portion of a handlebar, comprising the steps of:

providing the grip with a lip formed integrally with the main body of the grip, said lip being directed radially inwardly and located along an entire front edge at an open end of the grip;

forming the grip and integral lip of elastic material;

bringing the grip into contact with a forward end portion of the handle portion of the handlebar in such a manner that a sealed chamber is defined between an inner surface of the grip and outer surface of the handle portion;

injecting air into the sealed chamber by an air injector, to expand the grip;

moving the grip over the handle portion of the handlebar until a predetermined position is reached; and

withdrawing the air from the sealed chamber to allow the grip to be brought into intimate contact at its inner surface with the handle portion at its outer surface, to enable the grip to be adhesively secured to the handle portion of the handlebar.

4,677,873

TRANSFER CASE WITH INTER-AXLE DUAL-PLANETARY DIFFERENTIAL

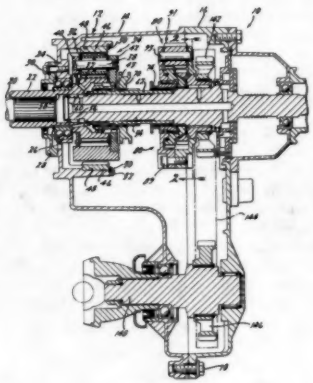
Richard E. Eastman, Central Square, and Randolph C. Williams, Weedsport, both of N.Y., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 23, 1985, Ser. No. 812,661

Int. Cl.[4] F16H *37/08*

U.S. Cl. 74—665 GE **8 Claims**

1. In a transfer case apparatus adapted for driving a four wheel drive motor vehicle having front and rear ground engaging wheels, said apparatus including a housing, an input shaft adapted for connection to a transmission of the motor vehicle, a pair of first and second output shafts supported for rotation in said housing, said first output shaft adapted for driving connection to the rear ground engaging wheels and said second output shaft adapted for driving connection to the front ground engaging wheels, and a dual helical palentary differential gear assembly arranged in a compact manner for proportioning torque between said first and second output shafts, said dual planetary differential helical gear assembly comprising a dual planetary carrier including first and second longitudinally spaced carrier rings rotatable about the central axis of said first output shaft, said first carrier ring having a central opening formed with internal splines concentrically disposed about said first output shaft, first and second juxtaposed toothed helical gun gears concentrically disposed about said first output shaft, said first sun gear fixed to said first output shaft and having its teeth at a first uniform radius, said second sun gear journalled on said first output shaft and having its teeth at a second uniform radius a predetermined distance less than said first sun gear teeth radius, means interconnecting said second sun gear with said second output shaft, first and second sets of spur-type toothed pinion gears having identical unifrom diameters rotatably supported on first and second, respective, sets of pins disposed parallel to said central axis, said first and second sets of pins journalled between said carrier rings at first and second radial distances, respectively, outward from said central axis, wherein said first radial distance is a predetermined distance greater than said second radial distance, the teeth of each said first set pinion gear extending a first predetermined axial distance substantially equal to the axial extent of both said first and second sun gear teeth, the teeth of each said first set pinion gear positioned in meshing engagement with said first sun gear teeth while forming a predetermined clearance with said second sun gear teeth, the teeth of each said second set pinion gear extending a second longitudinal distance about one-half the axial extent of each



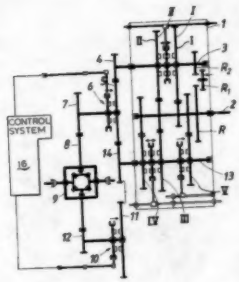
said first set pinion gear teeth so as to be substantially equal to the axial extent of said second sun gear teeth and in meshing engagement with said second sun gear teeth, said first asnd second sets of pinion gears disposed in paired relation such that each said first set pinion gear teeth in meshing engagement with a corresponding second set pinion gear teeth, said first sun gear having a predetermined number of gear teeth greater than the number of gear teeth on said second sun gear, a mode clutch collar having external spline thereon being axially movable relative to said dual planetary differential to a position wherein its external splines slidably engage said first carrier ring internal splines, and clutch means operative when engaged to drivingly interconnect said mode clutch collar with said input shaft, such that with said mode clutch collar external splines being in engagement with said first carrier ring internal splines and said clutch means being engaged differentiation is provided by said dual planetary differential between said first and second output shafts, and wherein the drive torque supplied to said input shaft is divided between said first and second output shafts in a ratio proportional to the number teeth on said respective first and second sun gears.

4,677,874

TRANSMISSION, PARTICULARLY FOR CROSS-COUNTRY MOTOR VEHICLES

Karl Friedrich, Leibnitz, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Mar. 18, 1986, Ser. No. 840,885
Claims priority, application Austria, Mar. 28, 1985, A 917/85
Int. Cl.[4] F16H 37/08, 3/08
U.S. Cl. 74—665 GC 3 Claims



1. In a transmission comprising

a change gear set comprising input shaft means, gear set output shaft means, a plurality of fixed spur gears non-rotatably connected to one of said shaft means, and a plurality of loose spur gears, each of which is rotatably mounted on and adapted to be selectively coupled to the other of said shaft means and permanently in mesh with one of said fixed spur gears, said loose spur gears comprising first and second groups of loose spur gears for relatively low and relatively high speeds, respectively, and

a second gear set adapted to be selectively driven by said output shaft means,

the improvement residing in that said input shaft means consist of an input shaft,

said gear set output shaft means consist of first and second gear set output shafts,

said fixed spur gears are non-rotatably mounted on said input shaft,

said loose spur gears of said first and second groups are rotatably mounted and adapted to be coupled to said first and second gear set output shafts, respectively,

first and second additional spur gears are non-rotatably connected to said first and second gear set output shafts, respectively,

a common idler gear is provided, which is in mesh with both said first and second additional spur gears,

a pinion is provided,

a first clutch is provided for selectively coupling said pinion to said common idler gear,

a final output gear is provided, which is permanently in mesh with said pinion,

said second gear set comprises a large spur gear, which is permanently in mesh with said second additional spur gear, a small spur gear, which is permanently in mesh with said final output gear, and a second clutch for selectively coupling said large and small spur gears to each other, and

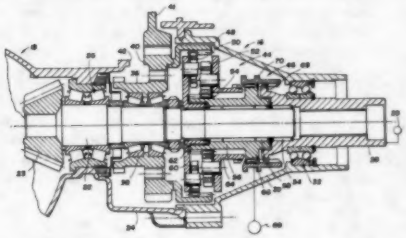
clutch control means are provided, which are selectively operable in one mode to engage said first clutch and disengage said second clutch and in another mode to disengage said first clutch and to engage said second clutch.

4,677,875

TRANSFER CASE FOR MULTIPLE DRIVE AXLE VEHICLE

Robert B. Batchelor, Birmingham, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed Dec. 9, 1985, Ser. No. 806,696
Int. Cl.[4] F16H 37/08, 1/42
U.S. Cl. 74—695 18 Claims



1. A transfer case for a vehicle drive train having a transmission comprising:

a housing;

input means for receiving the torque output from the vehicle transmission;

a first output shaft and first means for rotatably supporting said first output shaft in said housing;

a second output shaft and second means for rotatably supporting said second output shaft in said housing; and

means for selectively driving said first and second output shafts in response to actuation of said input means, said means for selectively driving comprising a planetary gear set having an annulus, a first set of first planet gears engaged with said annulus, a second set of second planet gears, each second planet gear being engaged with one of said first planet gears, a sun gear engaged with said second planet gears, third means for rotatably mounting said sun gear in said housing and a planet carrier having means for rotatably supporting said first and second planet gears and co-axially secured to said first output shaft for rotation therewith, and further comprising clutch means for selectively engaging said sun gear with said planet carrier and said second output shaft,

wherein said input means comprises means for rotatably driving said annulus.

4,677,876

TORQUE-PROPORTIONING DIFFERENTIAL WITH CYLINDRICAL SPACER

Walter L. Dissett, Southfield, Mich., assignor to Tractech, Inc., Warren, Mich.

Filed Feb. 13, 1984, Ser. No. 579,712
Int. Cl.[4] F16H 1/38
U.S. Cl. 74—715 2 Claims

1. Gear differential apparatus for supplying driving torque from a drive shaft to a pair of aligned axially spaced output shafts, comprising

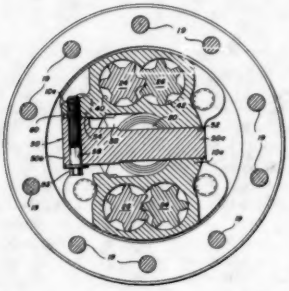
(a) a sectional differential carrier housing adapted to be rotatably driven by the drive shaft, said housing including a center body section, and a pair of end cover sections connected on opposite ends of said center body section, said center body section containing a central transverse bore (52) of circular cross-sectional configuration, one end of said transverse bore being enlarged to define a recess (54) on one side of said center body section;

(b) a pair of annular helical side gears journalled in corresponding aligned bores contained in opposite ends of said center body section, respectively, said side gears having splined inner circumferences for non-rotatable connection with the output shafts when the adjacent ends of the shafts

extend in axially spaced relation through aligned openings contained in said end cover sections, respectively;

(c) a plurality of pairs of differential helical pinions having threads of opposite hands, respectively, the pinions of each pair being mounted with an outside diameter running fit within longitudinal bores contained in opposite ends of said center housing section respectively, the adjacent ends of said bores being in communication and the adjacent ends of said differential helical pinions being in overlapping enmeshing engagement with each other, said pinions having axes parallel with the axis of, and being in enmeshing engagement with, said side gears, respectively, whereby the torque transmitted through said differential mechanism introduces gear tooth loads on said pinions which cause a frictional torque resistance as the pinions rotate within their respective pinion cavities, thereby introducing a torque bias in the differential mechanism;

(d) lock means for preventing axial displacement of the output shafts outwardly relative to the side gears, respectively; and



(e) cross pin spacer means for maintaining the output shafts in axially spaced relation, said cross pin spacer means consisting of

(1) a unitary cross pin having at one end a cylindrical shank portion (**50***a*) mounted in said transverse bore for contiguous engagement by the adjacent ends of the output shafts;

(2) said cross pin having at its other end an integral enlarged generally cylindrical head portion (**50***b*) mounted in said recess, said recess having a cylindrical wall surface of a diameter corresponding generally with that of said enlarged head portion; and

(3) retaining means preventing axial displacement of said cross pin relative to said housing center body section, said retaining means including a retaining member (**56**) that extends through a diametrically arranged passage contained in said enlarged head portion, at least one end of said retaining member extending in a corresponding opening contained in a support lug portion (**10***e*) of said central body section adjacent said recess.

4,677,877

ACCESSORY DRIVE WITH BAND BRAKE

Andrew G. Anderson, London; David A. Bullen, Ottowa, and Robert G. Ferguson, Wyeridge, all of Canada, assignors to Canadian Fram Limited, Chatham, Canada

Filed Aug. 30, 1985, Ser. No. 771,445

Int. Cl.[4] **F16H** *3/44, 57/10*

U.S. Cl. 74—785 **13 Claims**

1. A multi-speed accessory drive having a plurality of operating conditions in which an output member is rotated at the speed of an input or driving member or at a reduced speed ratio; the drive comprising:

a planetary gear set comprising a sun gear (**14**), a plurality of planet gears and a ring gear interconnected with said sun gear, wherein said sun gear is drivingly connected to the input member and said planet gears are drivingly connected to the output member,

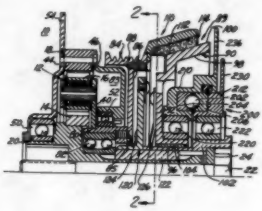
a pressure plate axially movable relative to the input member,

a driving link rotatably fixed to said input member including spring means fixed to said driving member and to a pressure plate for rotating said pressure plate and for axially urging said pressure plate away from said driving link;

clutch means comprising said pressure plate axially movable relative to the input member,

means for moving said pressure plate into contact with and for rotationally engaging said output member and for alternatively drivingly connecting said output member to said input member;

means for self-disengaging said ring gear during intervals when said pressure plate is in engagement with said output member to permit said output member to rotate at the



speed of the input member and for automatically halting the rotation of said ring gear when said pressure plate is disengaged from said output member to permit said output member to rotate at a predetermined ratio of the speed of said input member and

wherein said moving means includes a ball ramp actuator comprising a plurality of ramp supports rotationally isolated from the rotation of the input member and from said pressure plate and rotationally movable one relative to one another, said ramp supports supporting means for moving said pressure plate axially in response to the relative rotation of said supports and means for rotating said supports relative to one another and

wherein said rotating means comprises a rack and pinion mechanism connected to one of said ball ramp supports and includes a motor responsive to control signals input thereto for moving said one ball ramp support and wherein the other of said ball ramp supports includes means for preventing same from rotating.

4,677,878

HYDRAULIC TRANSMISSION CONTROL SYSTEM HAVING DIFFERENT STATE CORRESPONDING TO DIFFERENT OCTANE FUELS

Takahiro Yamamori, Tokyo; Yasuo Takagi, and Junichi Furukawa, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 19, 1985, Ser. No. 725,330

Claims priority, application Japan, Apr. 24, 1984, 59-81192; May 18, 1984, 59-98836

Int. Cl.[4] **B60K** *41/16*

U.S. Cl. 74—861 **10 Claims**

10. In a vehicle having a road wheel and an engine for operating on a fuel having an octane number, wherein the tendency of the engine to knock differs depending on the octane number of the fuel:

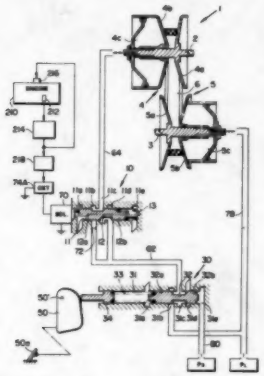
a transmission having an input member drivingly connected to the engine to receive the output produced by the engine and an output member drivingly connected to the road wheel;

said transmission being constructed to produce a shift in

ratio between the rotational speed of said input member and the rotational speed of said output member;

means for hydraulically controlling said transmission;

means for generating a fuel octane number indicative signal



when a change in octane number of t' uel on which the engine is operating occurs; and

means for modifying operation of said hydraulically controlling means in response to said fuel octane number indicative signal.

4,677,879

TRANSMISSION FOR FOUR-WHEEL DRIVE VEHICLES

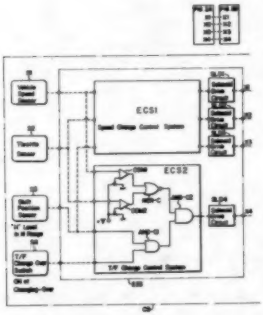
Choji Furusawa, Toyota, and Toshiaki Ishiguro, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jun. 19, 1984, Ser. No. 622,148

Claims priority, application Japan, Jun. 20, 1983, 58-109259; Jun. 20, 1983, 58-109258

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—866 **7 Claims**



1. An apparatus for controlling a transmission mechanism comprising a power transmission assembly for transmitting power from an engine,

an input member connected to an output side of the power transmission assembly,

a first power train operatively connected to the input member and providing at least two different speed-change ratios,

a second power train communicating with the first power train and including a dog clutch for cutting off and changing over power,

a brake assembly for locking said input member, and a clutch assembly for operatively engaging and disengaging the input member with said first power train, wherein the apparatus includes means for engaging said brake assembly in response to a signal indicative of changing-over of said second power train when said clutch assembly is in a disengaged state;

said means for engaging said brake assembly including a control system for controlling said brake assembly and a clutch assembly, the control system including:

(a) a shift position sensor for sensing the selected shift position of the first power train and providing a signal indicative thereof,

(b) changing-over sensing means for sensing the changing-over action in the second power train and providing said signal indicative of changing-over of the second power train, and

(c) a CPU receiving two output signals of the shift position sensor and the changing-over sensing means, and providing an output signal indicative of actuating the brake assembly,

wherein the CPU executes a program including the steps of:

(a) discriminating if the shift position is neutral (N),

(b) discriminating if the changeover switch is ON, and

(c) if both the steps (a) and (b) are YES, providing an output signal indicative of actuating the brake assembly.

4,677,880

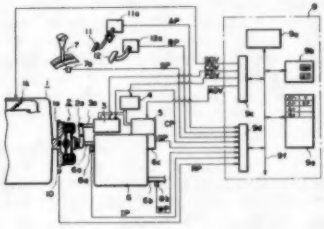
METHOD OF CONTROLLING AUTOMATIC TRANSMISSION IN ACCORDANCE WITH ENGINE OPERATION

Toshihiro Hattori, Ayase; Makoto Uriuhara, Yokohama; Hitoshi Kasai, and Yasuyoshi Asagi, both of Kawasaki, all of Japan, assignors to Isuzu Motors Limited, Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

Filed Dec. 24, 1984, Ser. No. 685,543

Int. Cl.[4] B60K *41/18, 41/10*

U.S. Cl. 74—866 **6 Claims**



1. A method of controlling a shifting operation of a synchromesh type automatic transmission coupled to an engine in a vehicle, comprising the steps of:

(1) detecting a vehicle speed, an accelerator pedal position, a selected gear position and an engine torque;

(2) determining an optimum gear position form a shift map based on the vehicle speed and the acceleration pedal position;

(3) comparing the optimum gear position with the selected gear position;

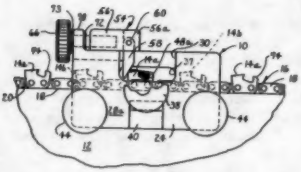
(4) determining if the engine torque is greater than or equal to a predetermined torque value, if the optimum gear position is greater than the selected gear position;

(5) reducing the supply of fuel to an engine, if the engine torque determined in step (4) is greater than the predetermined torque value, to reduce the engine torque below the predetermined torque value;

(6) releasing a clutch to disconnect the engine and the auto-

matic transmission when the engine torque is less than the predetermined torque value;
(7) shifting the automatic transmission to the optimum gear position; and
(8) engaging the clutch.

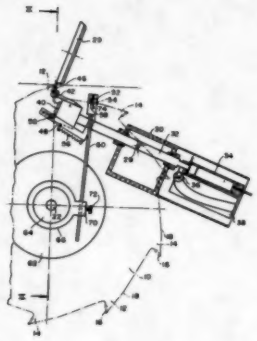
4,677,881
CHAIN SAW SHARPENER
James E. Jorde, 217 E. Center St., Basalt, Id. 83218
Filed May 2, 1986, Ser. No. 859,040
Int. Cl.[4] B23D *63/16*
U.S. Cl. 76—25 A **7 Claims**



1. A device for sharpening the cutting teeth of a chain saw while the chain is in place on the guide bar of the chain saw, the device comprising a generally U-shaped frame defined by an upper web and first and second parallel side walls for overlying the chain and guide bar of the chain saw; an open area adjacent the center of the upper web defining a sharpening area; clamp means associated with the first side wall to secure the frame to the guide bar; second clamp means associated with the side wall for lightly engaging the chain saw tooth to be sharpened in order to fix its position with respect to the sharpening area; a tooth stop pawl for adjusting the position of the tooth within the sharpening area, the tooth stop pawl being mounted in a sliding block received in a keyway in the upper web of the frame, the keyway being aligned with the guide bar of the chain saw and permitting only a single degree of freedom in the direction of the guide bar; a pawl member pivotally attached to the sliding block extending into the open sharpening area; an adjustment bolt associated with the tooth stop pawl and rotatably captured with respect to the frame for adjusting the position of the sliding block along the length of the keyway; and guide means having diagonally disposed bores associated with the second side wall and a rotary burr insertable into either of the guide bar bores for sharpening the teeth of the chain saw.

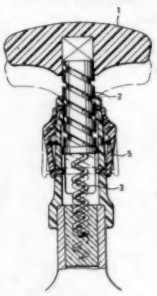
4,677,882
FEEDING MEANS FOR INTERMITTENTLY ROTATING A CIRCULAR SAW BLADE OF GREAT PITCH
Ernst Beck, Maselheim; Peter Lenard, Biberach an der Riss, and Hans Hutzel, Ummendorf, all of Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Biberach Riss, Fed. Rep. of Germany
Filed Oct. 28, 1985, Ser. No. 792,145
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1984, 3440500
Int. Cl.[4] B23D *63/14*
U.S. Cl. 76—77 **10 Claims**

1. A feeding means for intermittently rotating a circular saw blade of great pitch, comprising
a slip-on arbor for the saw blade,
a principal pawl designed for strokewise reciprocating motion such as to push the tooth face of a tooth of the saw blade upon every other forward stroke into a working position,
a secondary pawl disposed behind the principal pawl and designed to reciprocate together with the principal pawl such as to engage behind the tooth face of the next tooth upon each return stroke following the positioning of a tooth and to move said tooth face during the next successive forward stroke into an intermediate position at which the principal pawl may engage behind this tooth face during the subsequent return stroke, and
a stop which limits the movement of the secondary pawl,



characterized in that the stop is formed at a drag lever which is pivotable about a pivot bearing, at least approximately coaxial with the slip-on arbor, and connected to the secondary pawl by a guide means extending at least approximately in the direction of the movement of the secondary pawl.

4,677,883
CORK SCREW
Wen-Hsin Lee, 4th Fl., No. 61, Lui-Ho I Road, Kaohsiung City, Taiwan
Filed Jun. 9, 1986, Ser. No. 872,121
Int. Cl.[4] B67B *7/04*
U.S. Cl. 81—3.37 **3 Claims**



1. A cork screw comprising:
a rotary handle;
a stem connected to said handle and having a helical groove extending on the periphery of said stem;
a penetrating screw fixed to the bottom of said stem;
a hollow pedestal provided around said stem and said penetrating screw, the wall of said pedestal having an upper portion sleeved slideably on said stem, first openings in said upper portion, a bottom portion adapted to be seated against a spout of a bottle, and an engaging means provided in a portion between said upper portion and said bottom portion;
two dog members funcrumed at two opposite outer sides of said pedestal and each having a first engaging end capable of extending through one of said first openings to engage

with said helical groove, and a second engaging end opposite to said first engaging end capable of engaging releaseably said engaging means so as to temporarily maintain said first engaging end in a released position from said helical groove; and

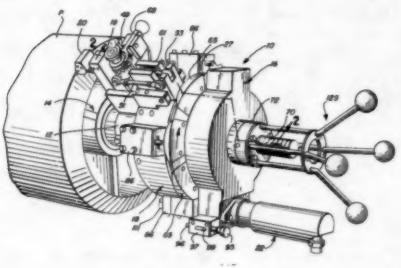
springs members attached to the outer side of said pedestal and normally biassing said first engaging ends to engage with said helical groove of said stem.

4,677,884

PORTABLE END PREP LATHE

Horst Kwech, Lake Bluff, and Peter K. Olson, Buffalo Grove, both of Ill., assignors to The E. H. Wachs Company, Wheeling, Ill.

Filed Apr. 5, 1985, Ser. No. 720,170
Int. Cl.[4] B23B *5/16*
U.S. Cl. 82—4 C **4 Claims**



1. A portable end prep lathe having a frame, means attachable to a pipe and movably mounting said frame, a rotatable tool head on said frame, means coacting between the frame and the tool head for rotating the tool head on said frame, a tool slide mounted on said tool head for movement radially of a pipe, means on the tool head for moving the tool slide on said tool head, and means mounting the tool head and frame for movement axially of the pipe, means responsive to the rotation of the tool head for moving the tool head and frame axially of the pipe, a star wheel in a fixed position relative to tool head rotation, a plurality of actuator pins circumferentially spaced about the tool head for successive engagement with the star wheel, said actuator pins being movable and having an inoperative position and a pre-operative position, means urging the actuator pins to an operative position, a retainer pin for each actuator pin for holding an actuator pin against the action of the urging means, said retainer pin being movable into a slot to free the actuator pin in response to the rotation of an actuator pin, each actuator pin having a cross pin, and manually operable means on the frame for engaging a cross pin to rotate an actuator pin and cause an actuator pin to move from pre-operative position to operative position as an actuator pin moves past said manually operable means.

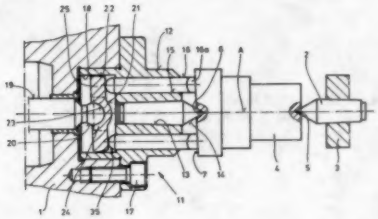
4,677,885

FACE DRIVER FOR CENTERING AND DRIVING WORKPIECES CHUCKED IN A LATHE

Herbert Schmid, Renningen, and Karl Hiestand, Pfullendorf, both of Fed. Rep. of Germany, assignors to Sandvik Kosta GmbH and SMW Schneider & Weisshaupt GmbH, of DEX

Filed May 15, 1986, Ser. No. 863,611
Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517633
Int. Cl.[4] B23B *33/00*
U.S. Cl. 82—40 R **15 Claims**

1. A face driver for centering and driving a workpiece to be chucked in a lathe, comprising a support having one end with a dead center adapted to engage against the workpiece and having at least four axially circumferentially spaced recesses around the dead center, a driving pin movable in each of the recesses and having first ends adapted to press against the workpiece and opposite second ends, said support having an opposite end with a cylindrical recess, a pressure plate floatably retained within the recess and having one side with engagement portions in engagement with respective second ends of said pins, recess means for each engagement portion of said



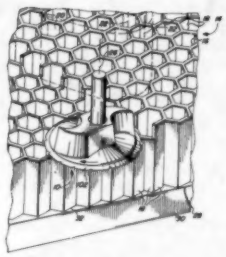
pressure plate which renders each engagement portion independently elastically deformable, said pressure plate having an opposite side, and a compression member engaged against the opposite side of said pressure plate urging said plate and said driving pins toward the workpiece, so that each independently elastically deformable engagement portion independently and elastically urges its driving pin toward the workpiece.

4,677,886

HONEYCOMB CUTTER AND CHIP BREAKER/CHAF REMOVER

Horst W. Neu, Torrance, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Dec. 12, 1985, Ser. No. 808,317
Int. Cl.[4] B23P *15/28*; B26D *1/14*
U.S. Cl. 82—53 **9 Claims**



1. A tool for machining a workpiece of honeycombed material or the like comprising, in combination:

a honeycomb cutter member, said honeycomb cutter member having a cutting knife and an axial shaft, said cutting knife being disc-shaped and rotatable about its center, said cutting knife having a sharp, peripheral edge extending radially outwardly to slice or cut a workpiece when rotated, said shaft having an inboard end adapted to be received by a rotational motion imparting mechanism, said shaft having an outboard end secured to said cutting knife for rotation therewith, with the axis of rotation of said shaft passing through the center of said cutting knife; and

a chip breaker/chaf remover device having a central, axial bore mountable over said shaft with the outboard face of said chip breaker/chaf remover device located in association with the inboard face of said cutting knife for rotation therewith, said chip breaker/chaf remover device having at least one sharp, essentially circumferentially directed,

radially outward breaker edge located radially inwardly of the radially outward edge of said cutting knife for breaking previously cut portions of the workpiece, said breaker edge being skewed toward the axis of rotation of said shaft as the edge recedes from the cutting knife, and said breaker edge also being slanted circumferentially backward from the cutting edge to provide progressive relief both inwardly and backwardly from the cutting edge.

4,677,887

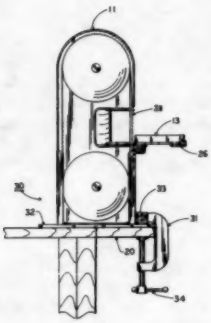
BAND SAW STAND

Leonard G. Martin, Box 217, Yanceville, N.C. 27379

Filed Nov. 4, 1985, Ser. No. 794,479

Int. Cl.[4] B27B *13/00*

U.S. Cl. 83—788 **6 Claims**



1. A stand for a portable band saw, comprising: a rectangularly shaped planar base, said base having a top and a bottom surface, a pair of channel shaped vertical supports, said vertical supports opposingly, diagonally attached to said base, said vertical supports for receiving the band saw to hold it upright on the base clamping means, said clamping means pivotally affixed to said top surface of said base, said clamping means pivotable about an axis parallel to said base for securing a support structure to the bottom surface of said base.

4,677,888

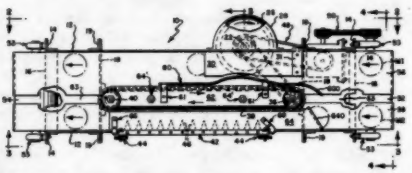
SELF-CONTAINED MACHINE FOR SIMULTANEOUSLY SLICING AND PERFORATING MUFFINS PRIOR TO PACKAGING

John Terragnoli, 103 Wallace Ave., Buffalo, N.Y. 14214

Filed Jun. 23, 1986, Ser. No. 877,375

Int. Cl.[4] A21C *15/04*; B26D *3/08, 3/30*; B26F *3/02*

U.S. Cl. 83—862 **9 Claims**



1. A self-contained machine for slicing and perforating baked goods, such as muffins, said machine including frame means, motor means, baked goods conveying means, slicing means and perforating means mounted on said frame means, and drive means operatively connecting said motor means with said conveying means, slicing means and perforating means, wherein the improvement comprises; said slicing and perforating means including guide means cooperating with said conveying means, slicing means and perforating means, for simultaneously slicing and perforating said baked goods, said motor means comprising but a single motor operatively connected to said conveying means, slicing means and perforating means by said drive means.

4,677,889

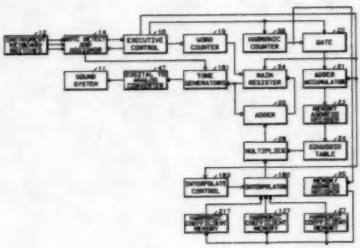
HARMONIC INTERPOLATION FOR PRODUCING TIME VARIANT TONES IN AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Oct. 25, 1985, Ser. No. 791,631

Int. Cl.[4] G10H *1/06, 7/00*

U.S. Cl. 84—1.01 **13 Claims**



13. In combination with a musical instrument in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed from a preselected set of harmonic coefficients at regular time intervals and converted into musical tones, apparatus for producing musical tones having a time variant spectra comprising;

a plurality of harmonic coefficient memory means each storing a preselected set of harmonic coefficients,

harmonic addressing means for simultaneously reading out a sequence of corresponding harmonic coefficients from each of said plurality of harmonic coefficient memory means,

a harmonic coefficient select means whereby a subset of said harmonic coefficients read out from said plurality of harmonic coefficient memory means are selected,

an interpolation means whereby an interpolated harmonic coefficient value is generated in response to said selected subset of harmonic coefficients,

a means for computing responsive to each said interpolated harmonic coefficient value whereby said amplitudes of points defining the waveform of said musical tone are computed, and

a means for producing a musical tone from said amplitudes of points.

4,677,890

SOUND INTERFACE CIRCUIT

Robert J. Yannes, Media, Pa., assignor to Commodore Business Machines Inc., West Chester, Pa.

Filed Feb. 27, 1983, Ser. No. 455,974

Int. Cl.[4] G10G *1/12, 1/46*

U.S. Cl. 84—1.19 **8 Claims**

1. A sound interface circuit for selectively generating a plurality of voices, for use in a home video game circuit, said name circuit having a programmable microprocessor holding digital instruction signals, analog game player inputs and providing a first and second non-overlapping clock pulses, comprising:

data buffer circuit means for receiving said miroprocessor instruction signals for providing control instructions;

a data bus connected to said buffer means for carrying said

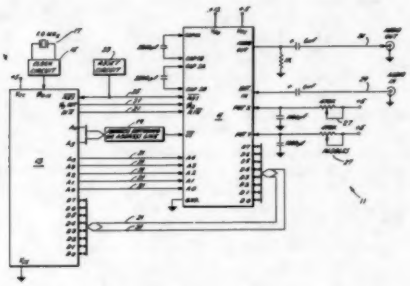
control instructions connected from said data buffer means;

a means connected to said analog game play inputs for analog to digital transformation of each said analog player input to digital player instructions, said player instructions being fed to said data bus;

a first, second and third tone oscillator circuit means, each individually operated and independently structured, for each providing a separate tone frequency according to a digital instruction signals from said data bus;

a first, second and third envelope generator circuit means each individually operated and independently structured for each providing a frequency envelope format according to a digital instruction signals from said data bus;

a first, second and third amplitude modulator circuit means, each independently structured for each providing an amplitude modulated signal, said first modulator circuit



means being connected to said first tone oscillator circuit means and said first envelope generator circuit means, said second modulator circuit means being connected to said second tone oscillator circuit means and said second envelope generator circuit means, said third modulator circuit means being connected to said third tone oscillator circuit means and said third envelope generator means;

a digital filter circuit means for shaping a signal, said digital filter circuit means operating according to digital instruction signals from said data bus and being connected thereto;

a volume controller connected on said digital filter signals circuit means output and operative according to a digital instruction from said data bus; and being connected thereto; and

switch circuit means for selectively interconnecting any of said first, second and third amplitude modulator circuit means outputs with said digital filter means.

4,677,891

TREMOLO BRIDGE FOR GUITARS

Charles A. Gressett, Jr., Brea; John F. Page, La Mirada; Daniel J. Smith, Placentia, and John Carruthers, Venice, all of Calif., assignors to Fender Musical Instruments Corporation, Brea, Calif.

Filed Jan. 31, 1985, Ser. No. 697,221
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—313 **2 Claims**

1. In combination with an electric guitar having a body, neck, and strings extending over said body and neck, a tremolo apparatus characterized by the substantial absence of cross talk between the strings even when at least one string is bent, said apparatus comprising:

(a) a tremolo plate;

said tremolo plate having a crank arm extended downwardly therefrom and fixedly connected to such plate,

(b) a plurality of bridge saddles mounted on said plate,

there being one bridge saddle for each string,

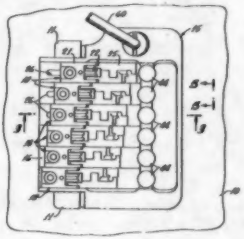
(c) means to adjust each individual one of said bridge saddles toward or away from said guitar neck, in order to achieve proper intonation,

(d) a tremolo arm connected to said plate to actuate the same,

(e) spring means connected to said crank arm to bias said tremolo plate toward a predetermined position, and

(f) pivot means to pivotally associate said plate with said guitar body,

said pivot means having a pivot axis located at such dis-



tance from said guitar neck, and said adjustment means (c) being so constructed that, the intonation points on said saddles may be adjusted between positions closer to said neck than is said axis, and positions farther from said neck than is said axis, the moment between the axis of said pivot means (f) and the region where said spring means connects to said crank arm being, when said plate is floating and not actuated, at least nine times the moment arm between the axis of said pivot means and the intonation points on said bridge saddles (b),

said latter moment arm being very small when said plate is in normal unactuated condition.

4,677,892

ELECTRICAL ACTUATOR FOR PERCUSSION INSTRUMENTS

Justin Kramer, 1028 W. 8th Pl., Los Angeles, Calif. 90017, and Richard H. Peterson, 11601 S. Mayfield Ave., Worth, Ill. 60482

Filed Oct. 1, 1985, Ser. No. 782,324
Int. Cl.[4] G10D *13/08*
U.S. Cl. 84—405 **17 Claims**

1. A highly damped actuator for striking a sound-producing surface in a percussion musical instrument, comprising:

armature means;

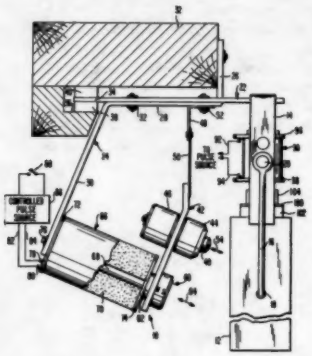
clapper means mounted on said armature;

means for mounting said armature for motion of said clapper between a rest position spaced from a sound-producing surface and an impact position at said sound-producing surface;

a permanent magnet-solenoid set for holding said clapper at said rest position; and

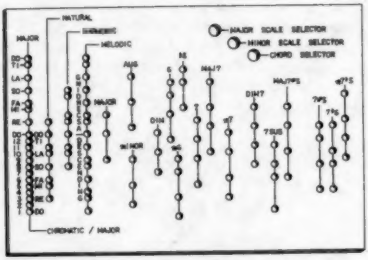
means for applying an electrical current pulse to said solenoid, said pulse being of sufficient amplitude to produce a repelling magnetic field between the permanent magnet and the solenoid of said set which drives said armature from its rest position toward said impact position and which causes said clapper to strike said sound-producing

surface, and for terminating said pulse to collapse said magnetic field between the permanent magnet and the



solenoid of said set to facilitate return of said armature to its rest position for retention by said permanent magnet.

4,677,893
QUICK MUSIC NOTES SLIDE RULE
E. Carl Fahnestock, 1270 Main St., Glastonbury, Conn. 06033
Filed Jul. 11, 1985, Ser. No. 748,172
Int. Cl.[4] G09B *15/02*
U.S. Cl. 84—473 **11 Claims**



1. In a Music Note Letter and Symbol Display Device comprising a data storage member on which are displayed multiple columnar segments of music note letter and symbol combinations where within each said columnar segment are contained three (3) columnar displays which are each uniquely identified by their relative positions within each said columnar segment as left positioned, center positioned and right positioned respectively and where the physical spacing between the said left positioned columnar display and the said center positioned columnar display is equal to the physical spacing between the said center positioned columnar display and the said right positioned columnar display, and where,

the physical spacing between the said columnar displays of said columnar segment is equal to the physical spacing between the columnar displays which are contained within any other columnar segment, and where,

the physical spacing between any two (2) physically adjacent columnar segments is equal to the physical spacing between any other two (2) physically adjacent columnar segemtns, and where,

the physical spacing between any two (2) physically adjacent rows which are contained within any columnar display of any columnar segment is equal to the physical spacing between any two (2) other physically adjacent rows which are contained within any other columnar display which is contained within any other columnar segment, and where,

the music note letter and symbol combinations which are either overtly displayed or covertly implied for all rows within any columnar display are ordered by a musically chromatic relationship wherein the unique music note letter and symbol combination which is either overtly displayed or covertly implied within any unique row which is contained within any unique columnar display has a musical value which is one (1) musically chromatic pitch value higher than either the overtly displayed or covertly implied value defined for a first adjacent row which is contained within the said unique columnar display and which said first adjacent row is relatively positioned below the said unique row, and wherein,

the said unique music note letter and symbol combination which is either overtly displayed or covertly implied for said unique row has a musical value which is one (1) musically chromatic pitch lower than either the overtly displayed or covertly implied value defined for a second adjacent row which is contained within the said unique columnar display and which said second adjacent row is positioned relatively above said unique row, and where,

the musical value which is either overtly displayed or covertly implied for said unique row which is contained within said unique columnar display is identical in musical value to either the overtly displayed or covertly implied musical value or its enharmonic equivalent which is displayed in the same relative row within each of the other two (2) columnar displays which are both contained within the said unique columnar segment which contains said unique columnar display, and where,

either the overtly displayed or covertly implied musical values or their enharmonic equivalents which are defined for said unique row which is contained within all columnar displays within said unique columnar segment are seven (7) chromatic pitch values lower than either the overtly displayed or covertly implied musical values or their enharmonic equivalents which are defined for the same relative row which is contained within the physically adjacent columnar segment which said physically adjacent columnar segment is positioned relatively to the right of said unique columnar segment, and whereby,

the means for the retrieval of music note letter and symbol combination data is provided by positioning over the said data storage member a data retrieval member which is slidably mounted and which contains readout apertures through which music note letter and symbol combinations can be viewed, and where,

within the said data retrieval member are positioned three (3) key apertures which are used to position the said data retrieval member for the retrieval of music note letter and symbol data through the other said readout apertures, and where,

the said data retrieval member is in a position for retrieval of music note letter and symbol combination data through the other said readout apertures when music note letter and symbol combination data is simultaneously displayed through all three (3) said key apertures, and where,

the musical scale readout apertures which are used in the retrieval of music note letter and symbol combinations which define Major and Minor Scales are positioned to function in cooperation with the three (3) key apertures such that the music note letter and symbol combinations which are viewed through the said musical scale readout apertures are retrieved from only the said relative left positioned columnar display of each participating columnar segment, and where,

the unique music note letter and symbol combination displayed through a unique readout aperture for a unique positioning of the three (3) said key apertures defines a unique musical note which is a part of the musical expres-

sion of either a musical scale or a musical chord, and where,

the said unique music note letter and symbol combination which is displayed on the data storage member in a unique relative columnar display positioning and viewed through said unique readout aperture is used to express a musical note which is a part of another musical expression of either a musical scale or musical chord by display through a second readout aperture which is positioned in the same relative row position and the same relative columnar display positioning as said unique readout aperture and which said second readout aperture is positioned on the said data retrieval member relatively to the left of said unique readout aperture, and where,

each music note letter and symbol combination which is displayed on the said data storage member is uniquely located in a relative left positioned or center positioned or right positioned columnar display and defined row positioning within a unique columnar segment whereby each said music note letter and symbol combination is defined for cooperative use only through apertures which have been uniquely defined for functioning within the same relatively positioned columnar display and defined row positioning on the said data retrieval member, and where,

the musical note letter and symbol combination which is displayed through a readout aperture is the proper musically correct notation which will define a musical note value used in the musical expression of either scale or chord information for Major or Minor musical keys.

4,677,894

DEVICE FOR THE CENTERING RETENTION OF AMMUNITION IN AN AMMUNITION RECEIVER

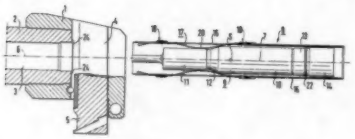
Leonhard Pongratz, Karlsfeld; Ferenc Kotai, and Markus Spotzl, both of Munich, all of Fed. Rep. of Germany, assignors to Krauss-Maffei A.G., Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,014

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536672

Int. Cl.⁴ F42B *33/00*

U.S. Cl. 86—45 **15 Claims**



1. A device for centering retention of ammunition comprising:

means for receiving ammunition;

means for gripping an ammunition cartridge rim associated with said means for receiving;

means for retaining ammunition in axially centered alignment within said means for receiving wherein said means for retaining comprises;

a plurality of circumferentially distributed, radially inwardly acting leaf springs arranged on said means for receiving;

means for fastening a rearward end of each leaf spring to said means for receiving at a first radial plane;

means for fastening a forward position of each leaf spring to said means for receiving at a second radial plane;

a plurality of recesses in said means for receiving between said first radial plane and said second radial plane, wherein a radially inwardly contoured portion of said leaf springs extends through said recesses;

a radially inward directed forward extension of said leaf springs wherein said forward extension extends past said second radial plane and away from said first radial plane.

4,677,895

MULTIPLE RAIL ELECTROMAGNETIC LAUNCHERS WITH ACCELERATION ENHANCING RAIL CONFIGURATIONS

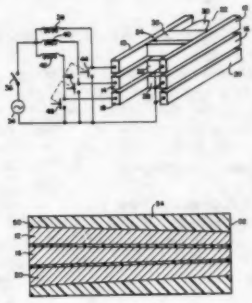
Richard J. Carlson, Santa Clara, Calif., and George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,993

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.⁴ F41F *1/02*

U.S. Cl. 89—8 **9 Claims**



1. An electromagnetic projectile launcher comprising:

four generally parallel conductive rails lining a bore;

first and second sources of electric current;

means for conducting current between a first pair of said rails and between a second pair of said rails, and for propelling a projectile along said rails;

means for substantially simultaneously connecting said first current source to a first end of said first pair of rails and for connecting said second current source to a first end of said second pair of rails; and

wherein the total stacked height of said rails adjacent to said bore decreases from said first ends of said rails to a second end of said rails, thereby for a given current, increasing acceleration force on said projectile, caused by current flowing through said rails and through said means for conducting current, as said means for conducting current travels from said first ends to said second ends of said rails.

4,677,896

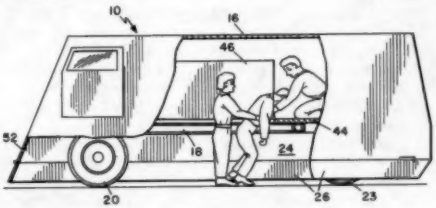
RESCUE VEHICLE

Jerome S. Litvinoff, 6536 Crystalaire Dr., San Diego, Calif. 92120

Filed Dec. 17, 1984, Ser. No. 682,078

Int. Cl.⁴ F41H *5/12*

U.S. Cl. 89—36.08 **3 Claims**



1. A rescue vehicle comprising:

a vehicle body having a front and rear end, sides, roof and floor defining at least one internal vehicle compartment;

vehicle wheels rotatably mounted on the vehicle body;

drive means within the vehicle body for driving the wheels to propel the vehicle;

the vehicle body having an armor construction exterior shell;

the shell having armored front, rear and side skirt sections which extend downwardly around the periphery of the body from the floor level to a level close to the ground level and enclose said vehicle wheels to from a shielded space beneath the vehicle;

the front, rear and side skirt sections each terminating in retractable flaps which are moveable between a lowered position in which they extend downwardly close to the ground level and a raised position in which they are raised above the ground;

the front flap covering a front entry opening when lowered, the front entry opening being of dimensions sufficient for driving the vehicle forwardly over a prone, injured person in front of the vehicle with some clearance;

control means within the vehicle body for selectively raising and lowering the front flap;

at least one trap door in said floor for providing access from the ground beneath said floor to the internal compartment;

the vehicle floor at the front end of the vehicle having no downward projections and being raised above ground level by a sufficient distance to enable the vehicle to be driven forwardly with some clearance over a prone, injured person until the person is positioned beneath the trap door; and

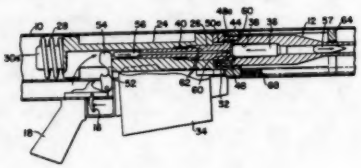
at least one window opening in the floor at the forward end of the vehicle adjacent a driver's position for allowing the driver to view the ground beneath the vehicle and position the vehicle over an injured person.

4,677,897

ANTI-ARMOR GUN

Ronnie G. Barrett, 745 E. Vine St., Murfreesboro, Tenn. 37130

Filed Dec. 19, 1983, Ser. No. 563,234
Int. Cl.[4] F41D *3/06*
U.S. Cl. 89—166 **5 Claims**



1. A shoulder-firable gun comprising:

(a) an elongated housing having a front portion, a rear portion, an upper portion, and a lower portion, said rear portion comprising a shoulder stock,

(b) trigger mechanism in the lower portion of said housing,

(c) an elongated bolt carrier received within said housing for longitudinal, reciprocable movement, said bolt carrier having a coaxial forward-opening bolt cavity,

(d) an elongated bolt slidably received within and projecting forward from said bolt cavity, the front portion of said bolt comprising radially projecting bolt locking lugs and an elongated reciprocable coaxial firing pin,

(e) said bolt cavity having a rear seat for engaging a rear portion of said bolt when said bolt is fully retracted within said cavity,

(f) bolt spring means in said bolt carrier normally biasing said bolt forward,

(g) cam and slot means interconnecting said bolt and bolt carrier to provide limited rotary movement of said bolt relative to said bolt carrier during longitudinal movement of said bolt relative to said bolt carrier,

(h) an elongated recoil spring within said rear portion of said housing and in coaxial alignment with and behind said bolt carrier,

(i) an elongated barrel comprising a rear barrel portion having a barrel chamber and terminating in an eniarged bolt locking collar,

(j) said bolt locking collar having radially inward directed collar locking lugs for engaging and disengaging said bolt locking lugs in a battery position,

(k) a front bushing fixed in the front end portion of said housing for slidably receiving said barrel for longitudinal reciprocable movement,

(l) a rear bushing fixed in said housing substantially behind and in coaxial alignment with said front bushing and in front of said bolt locking collar,

(m) a barrel travel stop member fixed within said housing between said rear bushing and said front bushing and encompassing at least a portion of said barrel,

(n) an abutment member fixed on and substantially encompassing said barrel between said stop member and said front bushing to engage said stop member to limit the rearward movement of said barrel,

(o) barrel spring means connecting said barrel to said housing to bias said barrel forward to a battery position,

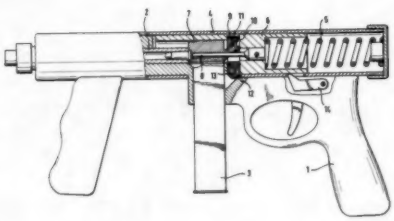
(p) said bolt locking lugs counter-rotating and disengaging said collar locking lug after said abutment member engages said stop member during the rearward travel of said barrel, whereby said bolt carrier continues its rearward movement against the action of said recoil spring while said bolt rotates forward relative to said bolt carrier, and said barrel is biased forward to its battery position by said barrel spring.

4,677,898

HAND FIREARM

Satish K. Malhotra, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 19, 1986, Ser. No. 831,154
Claims priority, application Austria, Feb. 20, 1985, 504/85
Int. Cl.[4] F41D *3/00*
U.S. Cl. 89—187.01 **3 Claims**



1. A hand firearm having a forward and a rear end defined by the direction of fire, comprising

a stock,

a barrel attached to said stock, said barrel defining a longitudinal axis of said firearm along said direction of fire,

a return spring located at the rear end of said firearm and being aligned with said longitudinal axis,

a breech block carrier located forward of said drum spring and along said longitudinal axis, said breech block carrier being displaceable against the biasing force of said return spring,

a breech block received within said breech block carrier, said breech block being operable between open and closed positions, said breech block being displaceable along said longitudinal axis relative to said breech block carrier,

an ignition pin traversing said breech block,

latch means disposed on said breech block carrier, said latch means located to the rear of said breech block along said longitudinal axis and in a plane of symmetry of said breech

block, said latch means being displaceable along said longitudinal axis and in a direction transverse to said longitudinal axis, said latch means having a rearward oblique face,

said stock of said firearm including a forward oblique counterface adapted to be in registry with said face, said face and said counterface having the same degree of obliquity, said face and said counterface opposing each other with a small amount of play when said breech block is in the closed position,

said latch means moving in said transverse direction when ignition of said firearm is effected and said face and counterface come into contact with each other,

said breech block, said breech block carrier, and said latch means carrying out a joint recoil movement when ignition of said firearm is effected.

4,677,899
APPARATUS FOR CONTROLLING AN ADJUSTABLE MEMBER

Heinz Schulte, Marktheidenfeld, and Norbert Mucheyer, Rechtenbach, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

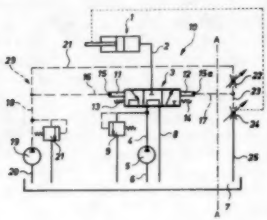
Division of Ser. No. 188,453, Sep. 18, 1980, abandoned. This application Feb. 25, 1986, Ser. No. 832,634

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940403

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] F15B *11/08*

U.S. Cl. 91—403 **5 Claims**



1. An apparatus for positioning an adjustable member as a function of a command signal and a controlled condition, especially for the positioning of a hoisting means on a tractor or the like, the apparatus comprising:

an operating circuit having a bidirectional positionable valve with a valve slide and with first and second control devices for regulating flow of pressure medium from a supply tank to the adjustable member;

a control circuit connecting a control pressure medium source to said control devices for said positionable valve, said control circuit having first and second adjustable throttles, said first adjustable throttle being connected between the supply tank and a junction of said control circuit and said first control device, said second adjustable throttle being connected between said control pressure medium source and said junction and in series with said first adjustable throttle;

said junction being between said first and second throttles and being connnected to said first control device through a fifth adjustable throttle; and

sixth and seventh adjustable throttles being connected in series between said control pressure medium source and the supply tank, and an eighth adjustable throttle being connected between said first control device and a junction between said sixth and seventh throttles, said fifth and eighth throttles being mechanically coupled for inverse operation.

4,677,900
PISTONS FOR INTERNAL COMBUSTION ENGINES

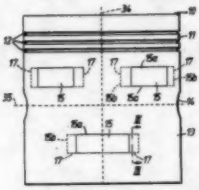
Jonathan D. Philby, Rugby, England, assignor to AE PLC, Warwickshire, England

Filed Jul. 26, 1985, Ser. No. 759,650

Claims priority, application United Kingdom, Aug. 4, 1984, 8419928

Int. Cl.[4] F16J *1/04*

U.S. Cl. 92—212 **18 Claims**



1. A piston for reciprocation in a lubricated cylinder of an internal combustion engine having a central piston axis and comprising:

a crown,

a gudgeon pin bore defining a gudgeon pin bore axis,

a skirt having two opposed portions,

at least one strip of plastics material carried on at least one of said skirt portions,

at least one strip of plastics material carried on the other of said skirt portions,

each said at least one strip of plastics material projecting beyond the associated skirt portion to prevent the formation of a film of lubricant between the skirt and said cylinder,

each said at least one strip of plastics material being rectangular and having a width and length substantially greater than the thickness thereof to allow each said one strip of plastics material to tilt relative to the associated skirt portion, to permit the formation between each strip and an associated lubricated cylinder of a hydrodynamic film of lubricant on reciprocation of the piston in said associated cylinder.

4,677,901
FIBER-REINFORCED PISTON FOR INTERNAL COMBUSTION ENGINES AND ASSOCIATED METHOD OF CONSTRUCTION

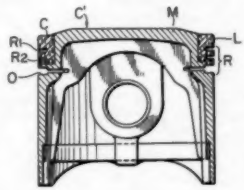
Keisuke Ban, Fujimi, and Akimasa Daimaru, Oomiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 388,666, Jun. 15, 1982, Pat. No. 4,498,219. This application Nov. 21, 1984, Ser. No. 673,664

Claims priority, application Japan, Jun. 18, 1981, 56-94461

Int. Cl.[4] F16J *1/04*

U.S. Cl. 92—213 **14 Claims**



1. A fiber reinforced piston for an internal combustion engine comprising a top land and a ring region provided with an uppermost ring groove, said top land and said ring region being defined by a reinforced part of the piston formed by a matrix metal reinforced with inorganic fibers, said reinforced

part of the piston being circularly symmetrical around an axis of the piston and forming an annulus around a top portion of the piston, said reinforced part having a cross-section, in a plane containing the axis of the piston, of substantially rectangular shape except for the uppermost ring groove, said piston having an upper crown surface, said reinforced part being formed as a cylindrical shell having an upper radial surface which is continuously formed in said upper crown surface, a lower radial surface, an inner cylindrical surface joining said upper and lower radial surfaces and an outer cylindrical surface having a radius equal to that of the outer cylindrical surface of the piston, said uppermost ring groove having an upper annular side wall surface, a lower annular side wall surface and an annular bottom surface connecting said upper and lower annular side wall surfaces, said inner cylindrical surface of the reinforced part having a smaller radius than that of the annular bottom surface of the uppermost ring groove, said reinforced part extending in the axial direction of the piston from the upper crown surface to a postion below said lower annular side surface of the uppermost ring groove, whereby said uppermost ring groove is totally defined within said reinforced part.

4,677,902

DEODORIZING DEVICE OF AN AIR CONDITIONING SYSTEM FOR AUTOMOTIVE VEHICLES

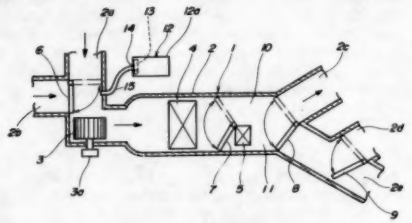
Masami Takemasa, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1985, Ser. No. 809,526

Claims priority, application Japan, Dec. 18, 1984, 59-190849[U]; Dec. 18, 1984, 59-190850[U]; Dec. 18, 1984, 59-190851[U]

Int. Cl.[4] B60H *3/00*

U.S. Cl. 98—2.11 **6 Claims**



1. A deodorizing device of an air conditioning system for use in an automotive vehicle, said air conditioning system including a housing having an air passage defined therein and at least one air outlet at a downstream end portion of said air passage for discharge of air into a passenger compartment of said automotive vehicle, an evaporator arranged in said air passage of said housing, a blower arranged in said air passage of said housing at a location upstream of said evaporator, and a power switch for selectively activating and deactivating said blower, said deodorizing device comprising:

a casing;

communication passage means communicating the interior of said casing with said air passage in said housing at a location upstream of said evaporator;

a volatile deodorant accommodated in said casing;

door means adapted to selectively open and close said communication passage means; and

driving means responsive to turning on and turning off of said power switch and a second switch, for driving said door means to selectively open and close, said driving means being adapted to open said door means when both said power switch and said second switch are turned on.

4,677,903

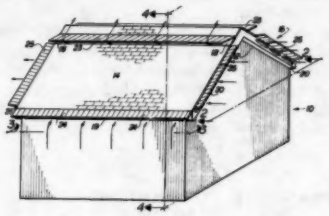
CONSTRUCTION UTILIZING A PASSIVE AIR SYSTEM FOR THE HEATING AND COOLING OF A BUILDING STRUCTURE

J. F. Mathews, III, P.O. Box 190647, Miami Beach, Fla. 33119

Filed Jul. 26, 1985, Ser. No. 759,205

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—31 **11 Claims**



1. A passive air system of the type primarily designed to heat and cool a building structure utilizing natural occurring phenomenon, said system comprising:

a. an external covering structure mounted on and disposed in spaced relation to a roof of a building structure and dimensioned to cover an exterior surface of the roof,

b. an air space defined between said external covering structure and said roof and extending substantially over the exterior surface of the roof,

c. interconnecting means comprising a plurality of studs disposed in spaced, substantially parallel relation to one another and extending between open, opposite longitudinal ends of said air space, said plurality of studs disposed between adjacent ones of said air passages for interconnecting said external covering structure and the exterior surface of the roof,

d. a plurality of air passages disposed within said air space and extending in communicating relation between said open, opposite longitudinal ends of said air space, said air passages structured to conduct air between said opposite ends of said air space and the exterior of said covering structure,

e. said plurality of air passages and said studs extending upwardly at an incline from a lower one of said longitudinal ends to an upper one of said opposite longitudinal ends; said plurality of air passages disposed to conduct air current by convection within said air space and over the exterior surface of said roof,

f. covering means movable secured to said covering structure for closing each of said opposite longitudinal ends of said air space, said covering means selectively movable between an open and a closed position,

g. said closed position defined by covering relation to said opposite longitudinal ends and separating relation to the interior of said air space relative to the exterior thereof, said open position defined by non-covering relation of two said opposite longitudinal ends and fluid communication between the interior and exterior of said air space,

h. said closed position of said covering means further defining air trapped within said air space, and said open position of said covering means further defiing an air flow throughout said air space between said opposite longitudinal ends, and

i. a plurality of air channels formed on the interior of said air space and extending in transverse relation to said plurality of air passages and extending between and communicating relation with open transverse ends of said air space, said plurality of air channels disposed and structured to conduct air therethrough between said transverse ends of said exterior of said air space, said covering means being further movably connected at each of said opposite transverse ends of said air space and movable between a closed

position and an open position, said open position defined by communicating relation of each of said transverse ends with the exterior of said air space, said closed position defined by covering relation to said transverse ends and trapped relation of air within said air space relative to the exterior thereof.

4,677,904

FLUID FLOW CONTROL ASSEMBLY

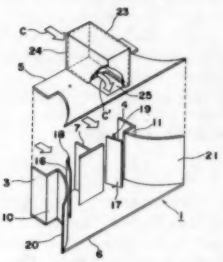
Takeshi Natsumeda; Motoyuki Nawa, both of Nara, and Norio Sugawara, Shiki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 19, 1986, Ser. No. 864,464

Claims priority, application Japan, May 20, 1985, 60-107325; Jun. 28, 1985, 60-142882

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—38.1 **14 Claims**



1. A fluid flow control assembly which comprises:

a fluid inlet structure having a fluid inlet region defined therein for the passage of fluid therethrough in one direction;

a fluid outlet defining structure fluid-connected with and positioned downstream of the inlet defining structure, said outlet defining structure including first and second guide walls extending outwardly from each other in a direction away from the inlet defining structure;

a partitioning member arranged in the inlet region for dividing the fluid flowing in the inlet region into first and second fluid streams as it passes through the inlet defining structure;

first and second deflector members disposed in respective paths of flow of the first and second fluid streams, each of said first and second deflector members being supported for angular movement about a respective axis between first and second positions for controlling the direction of flow of the respective fluid stream; and

a passage means for introducing a third fluid stream in between the first and second fluid streams generally at right angles to the direction of flow of any one of the first and second fluid streams;

said first and second deflector members being so positioned as to control a wall attachment of the first and second fluid streams relative to the first and second guide walls wherefore a draft of fluid emerging outwardly from the outlet defining structure can be directed outwardly, be biased in one lateral direction or be centered on a limited region.

4,677,905

FOOD STEAMING APPARATUS

Robert A. Johnson, 317 Origen St., Burlington, Wis. 53105

Filed Dec. 23, 1985, Ser. No. 812,815

Int. Cl.[4] A47J *27/04*

U.S. Cl. 99—413 **11 Claims**

1. A food heating apparatus placeable over the open top of a container of boiling water, said apparatus comprising a plate including a generally planar upper surface, a lower surface generally parallel to said upper surface, a central portion having a first width and a first thickness between said upper and lower surfaces, and an adjacent outer portion having a second width greater than said first width and a second thickness

between said upper and lower surfaces substantially less than said first thickness, said plate having therethrough a plurality of steam passages extending between said lower surface and said upper surface.

4,677,906

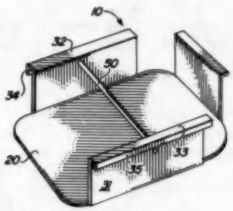
PAN INSERT

Virginia L. Lowe, 500 E. Silver Star Rd., Ocoee, Fla. 32761

Filed Feb. 6, 1986, Ser. No. 826,605

Int. Cl.[4] A47J *37/00, 43/18*

U.S. Cl. 99—450 **2 Claims**



1. A pan insert for use in a roasting pan for enabling removal of roast meat from the pan, said insert comprising:

(a) a substantially planar tray dimensioned for resting on an inner bottom surface of the roasting pan and having two opposing sides and two opposing ends transverse to said sides;

(b) first and second integral meat retaining side panels positioned on said two opposing sides of said tray and extending upwardly with respect to the bottom surface of the pan when the tray is seated on the bottom inner surface of the pan, top edges of the side panels being formed with outwardly extending portions forming handles, said first and second panels being sufficient to retain the meat and for enabling lifting of said tray, said top edges being disassociated from the pan;

(c) a third integral meat retaining panel extending upwardly from one end of said tray and spaced from the side panels along the periphery of the pan insert to define open liquid draining spaces along said tray between said third panel and each of said first and second panels such that the tray can be lifted slightly and tilted toward said third panel to drain the meat of any drippings while the third panel will retain the meat on the pan insert; and

(d) the other opposing end of said tray between said first and second side panels being free of panels and thus open sufficient for allowing the meat to be slid from said tray by tilting of said tray toward said other end.

4,677,907

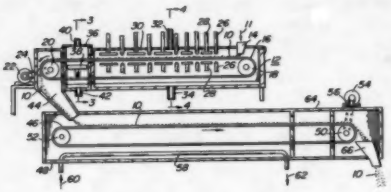
APPARATUS FOR PREPARING QUICK COOKING RICE AND VEGETABLES

Bjarne Weibye, Oslo, Norway, assignor to Apothekernes Laboratorium A.S., Oslo, Norway

Continuation of Ser. No. 550,273, Nov. 9, 1983, abandoned, which is a division of Ser. No. 414,140, Sep. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 298,676, Sep. 2, 1981, Pat. No. 4,385,074. This application Jun. 20, 1986, Ser. No. 878,400

Int. Cl.[4] **A23L** *1/00, 3/00*

U.S. Cl. 99—483 **3 Claims**



1. An apparatus for continuously preparing completely gelatinized rice or vegetable pieces comprising:

a selectively closable chamber;

a porous conveyor belt disposed for movement through said chamber for supporting the rice or vegetable pieces;

at least two sets of nozzles, each said set of nozzles including a water spray adjacent to a steam spray, said sets of nozzles positioned in an opposing relationship on opposite sides of said belt such that said belt passes between a water spray prior to passing between a steam spray during movement thereof and means for controlling the moisture added by said sets of nozzles to the rice or vegetables pieces.

4,677,908

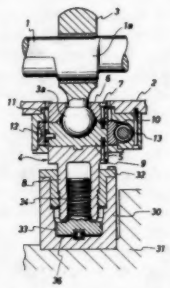
SLIDE ADJUSTING DEVICE FOR A PRESS

Shozo Imanishi, and Mitsuo Sato, both of Sagamihara, Japan, assignors to Aida Engineering, Ltd., Kanagawa, Japan

Filed Dec. 3, 1985, Ser. No. 804,251

Int. Cl.[4] **B30B** *1/26;* **F16H** *1/16*

U.S. Cl. 100—53 **4 Claims**



1. A press having a slide adjusting device and which comprises:

a press crown;

a crank shaft mounted on said crown and having an eccentric portion;

a connecting rod mounted on said eccentric portion;

a slide adjusting screw means connected to said connecting rod;

a worm wheel mounted on the outer periphery of said slide adjusting screw means for rotating said slide adjusting screw means with said worm wheel and for relative axial sliding movement of said slide adjusting screw means and said worm wheel;

means engaging said worm wheel for holding the worm wheel fixed against movement in the vertical direction relative to said press crown, whereby the slide adjusting screw means is moved in the rotational direction by rotation of said worm wheel and is slidable in the vertical direction in said worm wheel;

a worm shaft engaged with said worm wheel for rotating said worm wheel;

a motor mounted on said press crown and connected to said worm shaft for driving said worm shaft;

a press slide means threadedly engaged by the outer periphery of said slide adjusting screw means at the lower end thereof;

a piston vertically movably mounted on said press slide means with the upper portion thereof threaded to the lower end of said slide adjusting screw means;

said piston and said slide means defining an oil pressure chamber therebetween; and

pressure means for supplying oil under pressure to said oil pressure chamber and a control valve for controlling the level of said oil pressure.

4,677,909

WASTE TRANSFER PACKERS

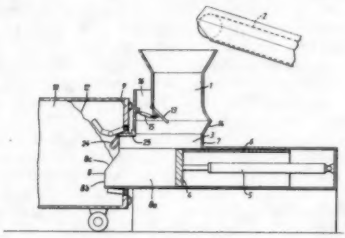
Brian G. Beesley; Clive Hurley; Ramon H. J. Brend; Thomas P. Edwards; Robert W. D. Sherrell, and Andrew J. Vickery, all of Devon, England, assignors to Devon County Council, Exeter, England

Filed May 8, 1985, Ser. No. 731,898

Claims priority, application United Kingdom, May 10, 1984, 8411933

Int. Cl.[4] **B30B** *15/06*

U.S. Cl. 100—229 **10 Claims**



1. A waste transfer packer and transfer container combination, said waste transfer packer comprising

a feed hopper,

a hollow spigot extending substantially horizontally from said feed hopper and adapted to penetrate through an aperture in a wall of the transfer container, and

a reciprocable ram operable substantially within said spigot to insert charges of waste material from said free hopper into said transfer container and to compress said charges therein, the maximum penetration of said ram within said transfer container being substantially coextensive with the penetration of said spigot and being of a distance in the order of half the ram height,

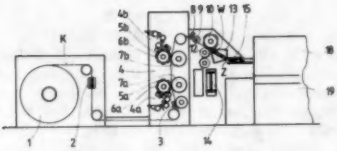
said spigot having a lower margin and coextensive therewith a pair of side walls, forward edges of said side walls extend upwards initially from a lower margin of said side walls about one quarter of the ram height whereafter said forward edges slope rearwards to about a level of a top of the ram.

4,677,910

PROCESS FOR PROCESSING SECURITY PAPER WEBS OR SECURITY PAPER SHEETS TO FORM BUNDLES OF SECURITY PAPERS

Runwalt Kuhfuss, Metzingen, Fed. Rep. of Germany, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed Jun. 19, 1985, Ser. No. 746,555
Claims priority, application Switzerland, Jul. 5, 1984, 3251/84
Int. Cl.[4] B41J *1/00;* **B07C** *5/00*
U.S. Cl. 101—93.01 **9 Claims**



1. Process for processing print carriers, printed with security paper prints, in the form of security paper webs or security paper sheets, the security paper prints of which are arranged in the manner of matrices in transverse rows and longitudinal rows, comprising the steps of

a. marking spoilt prints detected on said print carriers;

b. scanning the positions of all spoilt prints on the printed carriers and storing these positions before the print carriers are numbered;

c. feeding said print carriers in a numbering machine, where only the satisfactory security paper prints are serially numbered on the print carriers, while said serial numbering is interrupted when a spoilt print appears, and continued when the next satisfactory security paper print appears, the numbering mechanism of said numbering machine being controlled individually as a function of said stored positions;

d. applying cancellation prints to said spoilt prints, said operation being controlled as a function of said stored positions and being effected before cutting up said print carriers;

e. cutting up said print carriers to individual security papers cut to size;

f. eliminating the individual security papers having spoilt prints;

g. assembling the remaining serially numbered individual security papers to form bundles with complete numerical sequence in each case.

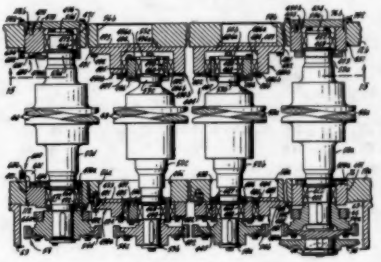
4,677,911

CONVERSION OF LETTERPRESS TO OFFSET PRINTING

Carl J. Hermach, Gulfport, Fla., assignor to Publishers Equipment Corporation, Carrollton, Tex.

Continuation of Ser. No. 473,967, Mar. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 209,222, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 175,126, Aug. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 122,908, Feb. 20, 1980, abandoned. This application Jun. 21, 1985, Ser. No. 747,383
Int. Cl.[4] B41F *5/06, 5/22*
U.S. Cl. 101—218 **14 Claims**

1. In an offset press unit having a main frame defining a pair of spaced apart walls including pairs of aligned bores adapted to receive and rotatably support a pair of plate cylinders, and two additional pairs of aligned bores spaced generally intermediate said pairs adapted to receive said plate cylinders, at least one of said pairs of aligned bores including bearing housings disposed therein and including cylinder support bearings therein, a pair of plate cylinders disposed inside said frame rotatably supported thereon in spaced apart relation, at least one of said plate cylinders being rotatably supported upon said cylinder support bearings of said bearing housings disposed in said at least one pair of aligned bores, and a pair of blanket cylinders disposed inside said frame, each rotatably supported for rolling contact with the other and with one of said plate cylinders at least a first non-rotatable internal support bracket secured inside the main frame to one of said walls and defining a bore eccentrically disposed with respect to each one of said pairs of aligned bores, at least a first a nonrotatable external support bracket secured outside the main frame to the other of said walls and defining a bore coaxially aligned with the bore



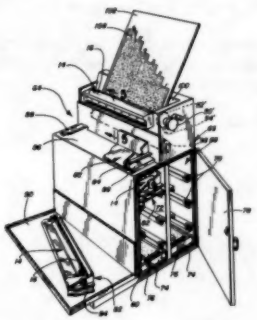
defined by said internal support bracket, cylinder supporting bearings disposed in said bores of said internal and external support brackets, and one of said printing cylinders rotatably supported upon said cylinder supporting bearings, wherein said internal support bracket overlies one of said bores of one of said aligned pairs and includes a pilot disposed within said bore, said external support bracket overlying the other one of said same pair of aligned bores and including a pilot disposed within said bore, said internal and external support brackets rotatably supporting a blanket cylinder.

4,677,912

INK FOUNTAIN PREPARATION STATION AND INTERCHANGEABLE INK FOUNTAIN SYSTEM

Eber L. Goodwin, Arlington Heights, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Apr. 16, 1985, Ser. No. 723,794
Int. Cl.[4] B41F *31/06, 31/30*
U.S. Cl. 101—365 **26 Claims**



1. A preparation station for ink fountains used in duplication machines, such as rotary offset lithographic machines, the ink fountain including a fountain trough defined by an elongated blade, an ink fountain roller and means for adjusting the ink flow-through gap between the blade and roller, comprising:

a housing independent of the duplicating machine;

support means for removably mounting an entire ink foun-

tain on the housing in position for ready access to said adjusting means;

light generating means on the housing behind the ink fountain for directing light through said gap whereby an operator can readily visualize the gap dimensions while adjusting the same preparatory to installing the preadjusted ink fountain in the duplicating machine; and

easel means on said housing adjacent the ink fountain for supporting a master, whereby an operator can readily compare the gap dimensions with the ink requirements of the master.

4,677,913

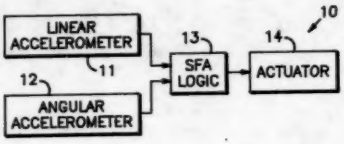
SAFE AND ARMING DEVICE

Louis P. Farace, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 17, 1986, Ser. No. 853,281

Int. Cl.[4] F42C *15/40*

U.S. Cl. 102—215 **11 Claims**



1. A safe and arming device comprising:

linear accelerometer means for determining linear acceleration, said linear accelerometer having an output;

angular accelerometer means for determining angular acceleration, said angular accelerometer having an output;

actuator means for actuating a munition, said actuator means having an input; and

safe and arming logic means for determining a time delay and actuating said actuator means, said safe and arming logic means having a first input coupled to said output of said linear accelerometer, a second input coupled to said output of said angular accelerometer, and an output coupled to said input of said actuator.

4,677,914

SAFETY DEVICE FOR A SPINNING PROJECTILE FUZE

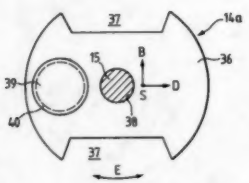
Robert Apothéloz, Greifensee, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Mar. 24, 1986, Ser. No. 843,226

Claims priority, application Switzerland, Apr. 4, 1985, 01480/85

Int. Cl.[4] F42C *15/26*

U.S. Cl. 102—233 **7 Claims**



4. A safety device for a fuze of a spinning projectile having a spin axis, comprising:

an escapement mechanism having an idle state and an operating state;

said escapement mechanism possessing a balance wheel having a center of gravity and a pivot axis;

said balance wheel comprising a substantially disk-like member having two substantially symmetrical trapezoidal-shaped recesses;

said balance wheel possessing a substantially central bore;

a pivot pin defining said pivot axis of the balance wheel and extending through said substantially central bore;

said balance wheel possessing a cutout which displaces the center of gravity of the balance wheel; and

said pivot axis of said balance wheel substantially coinciding with said spin axis of said spinning projectile when said escapement mechanism is in said operating state.

4,677,915

ARMOR-PIERCING PROJECTILE

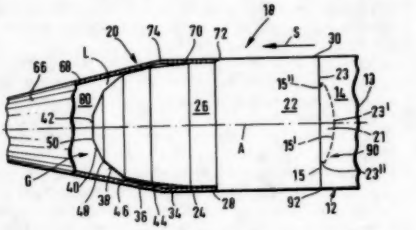
Juegen Boecker, Oberhausen; Klaus Gersbach, Willich, and Karl W. Bethmann, Moers, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 395,793, Jul. 6, 1982, abandoned. This application Jun. 25, 1984, Ser. No. 624,043

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 3126399

Int. Cl.[4] F42B *11/00*

U.S. Cl. 102—517 **8 Claims**



1. An improved armor-piercing sub-caliber projectile which is provided with an expendable ballistic hood covering a nose portion for transferring upon target impact a twisting moment onto a rearwardly disposed main portion of the sub-caliber projectile so that upon a flat target impact a steeper penetration angle of the main portion of the sub-caliber projectile is achieved, which improvement comprises:

(a) said nose portion has a rear surface and said main portion has a front surface, both of said surfaces being arranged transverse to the longitudinal axis of the projectile both said surfaces being at least partially flat and being abuttingly joined to each other so that said main portion is joined to said nose portion;

(b) said rear and front surfaces confronting each other and jointly defining a fracture zone of said projectile;

(c) said rear surface of said nose portion including a rearwardly projecting surface which engages into a rearwardly recessed surface of said front surface of said main portion;

(d) the projectile has a length to diameter ratio ranging from 10/1 to 30/1; and

(e) said nose portion is provided with means for reducing the friction between said nose portion and a target surface upon flat impact.

4,677,916

WELD SCANNER GUIDE AND MAGNETICALLY SUSCEPTIBLE TRACK

Francis J. Dodd, Lafayette, Calif., assignor to Nuclear Energy Systems, Inc., Danbury, Conn.

Filed Mar. 4, 1985, Ser. No. 708,173

Int. Cl.[4] B61B *13/04*

U.S. Cl. 104—118 **8 Claims**

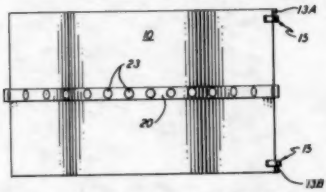
1. A weld scanner guide and magnetically susceptible track adapted to be belted about a pipe for weld inspection comprising

(a) an elongated flexible track element of sheet metal of a

length greater than the pipe circumference so that its end portions can overlap,

(b) mating clamps means at the opposite ends of the track element thereof for tightening the track element about the pipe with one track element end portion overlapping the other track element end portion,

(c) a guide element of rectangular cross section disposed about the circumferential centerline of the track element



and whether said track is bent about the pipe or in an unbent state said guide element is fixed against overall longitudinal movement relative thereto,

(d) the guide element being otherwise longitudinally movable with respect to the track element to allow both to be bent about the pipe, and

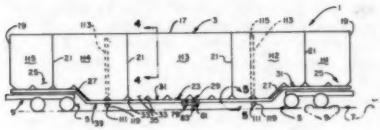
(e) the length of the guide element being such that its ends are in close proximity to one another when the track element is tightened about the pipe.

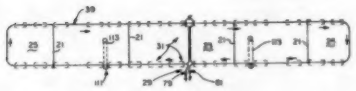
4,677,917

HIGH VOLUME COVERED HOPPER CAR WITH LOADING FROM BELOW AND AUTOMATIC UNLOADING

Richard H. Dugge, and Eugene J. Cordani, both of St. Louis County, Mo., assignors to ACF Industries, Incorporated, Earth City, Mich.

Filed Feb. 14, 1985, Ser. No. 701,880
Int. Cl.[4] B61D *7/32;* **B65G** *53/66*
U.S. Cl. 105—248 **14 Claims**





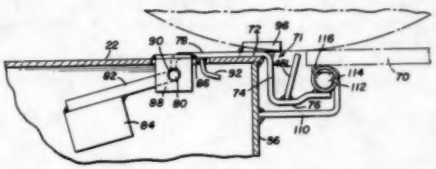
1. A railway car having a truck at each end thereof, a pair of spaced side sheets extending generally lengthwise of the car and forming the sides thereof, an end sheet at each end of the car spanning between the ends of the side sheets, a central floor extending between said trucks and an end floor at each end thereof above a respective truck, a plurality of pneumatic outlets constituting, at least in part, the central and end floors of said car, said outlets being generally horizontal and being in communication with a pluiverant lading within said car with certain of said outlets in said end floors being disposed above said trucks such that substantially all of the space above said trucks is effectively used to carry a lading and such that the lading above said trucks is unloaded via sid certain outlets, a flow path in fluid coupled relation with each of said outlets, said flow path having an inlet end and a product discharge end, said product discharge end being selectively connectable to means for moving air and lading entrained in the air through said flow path, valve means associated with each of said pneumatic outlets for opening and closing communication between each of said pneumatic outlets and said flow path such that when one of said outlets is in communication with said flow path, said lading in said car in operative association with said one outlet will become entrained in the air moving through said flow path such that the lading is pneumatically conveyed from the car, and control means responsive to the amount of lading being conveyed through said flow path from said one outlet for opening and closing said valve means associated with said one outlet thereby to maintain the amount of lading being conveyed from said one outlet within a predetermined range.

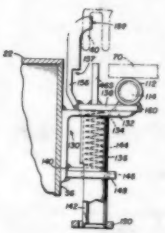
4,677,918

RAILROAD CAR WITH RETRACTABLE CLOSURE TRACK HELD DOWN BY BRIDGE PLATE

William R. Baker, Lawrenceville; Walter J. Marulic, Dunwoody, and James C. Robertson, Lawrenceville, all of Ga., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Aug. 23, 1985, Ser. No. 768,805
Int. Cl.[4] E05D *13/00;* **A47H** *17/06;* **B61D** *19/00*
U.S. Cl. 105—378 **16 Claims**





12. A railroad car for transporting four-wheel vehicles such as automobiles and trucks, comprising:

a floor and two side walls defining an interior space and terminating in an opening at each end;

an end closure at each of the car adapted to be displaced between a closed position overlying the end opening and an opened position which provides access to the entire end of the car;

an elongated closure support member at each end of the car disposed within the car interior in a horizontal plane;

the closure support member having a front run lateral to the car and a side run along each car side wall;

the closure comprising a pair of door assemblies;

each door assembly having a forward vertical end and a rear vertical end;

means vertically suspending the door assemblies from the closure support member so that the door assemblies are movable horizontally toward each other into closed position to close the car end with the forward ends of the door assemblies in abutting position to each other in the middle of the closure support member front run, and away from each other into open position with each door assembly supported on a closure support member side run;

a guide track, for the door assemblies, disposed within the

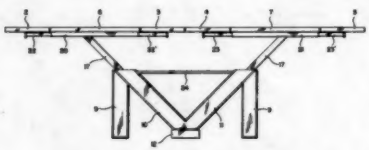
car interior in a horizontal plane and mounted to the car floor and extending upwardly therefrom;
the guide track having a front run lateral to the car and a side run along each car side wall;
guide means carried by the bottom of the door assemblies engaging the guide track to guide the door assemblies along the track when they are moved to open and close the car end;
the guide track front run having two spaced apart retractable track sections movable up and down from an up position wherein the track sections project above the floor level to a down position wherein the track sections are at a height not above the floor level;
bridge plate support means mounted on the car adjoining each retractable track section;
means maintaining a track section in said down position when a bridge plate is engaged with the adjoining bridge plate support means; and
each of the retractable track sections in said down position being positioned to be rolled over by the wheels on one side of four-wheel vehicles transported by the railroad car.

4,677,919

TRANSFORMABLE LOW DRAWING-ROOM TABLE

Giuseppe Baggiani, Via Provinciale Castiglionese, 58043 Castiglione della Pescaia GR, Italy

Filed Feb. 4, 1986, Ser. No. 825,931
Claims priority, application Italy, Feb. 13, 1985, 47674 A/85
Int. Cl.[4] A47B *57/00*
U.S. Cl. 108—63 **10 Claims**



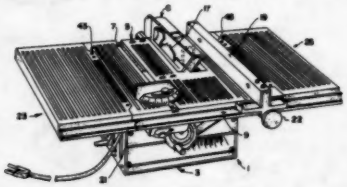
1. A transformable low drawing-room table comprising
four upper flat rectangular, side by side arranged, elements which are equal to one another in length and width,
two lower flat rectangular, side by side arranged elements which are equal to each other in length and width and have the same length as the upper flat elements while being each twice the width of one of said four upper flat elements, said four upper flat elements overlap said two lower flat elements,
outer elements of said upper flat elements being hinged to said lower flat elements along outer sides,
inner elements of said upper flat elements being hinged to said lower flat elements along inner sides, and
a pair of independently height adjustable supporting means each supporting two of said four upper elements and one of said two lower elements and each including
two central slanting braces forming a "V",
each slanting brace includes a groove defining an inner guide
a sliding arm guided within said inner guide,
an upper end of said sliding arm being integral with a horizontal bracket supporting one of said two said lower elements,
locking means for locking each sliding arm in a raised position, and
the length of said sliding arm being such that the movement of said sliding arm in an inclined direction causes said sliding arm to be locked and a sideward and outward shift of said lower flat element supported by said arm is allowed to extend to an extent corresponding to the width of an upper flat element.

4,677,920

ADJUSTABLE SIDE EXTENSIONS FOR WORK TABLE

Curtis J. Eccardt, St. Charles County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 3, 1985, Ser. No. 740,759
Int. Cl.[4] A47B *1/04*
U.S. Cl. 108—69 **7 Claims**



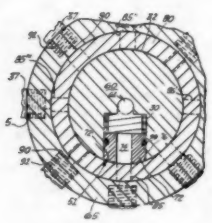
1. An adjustable side extension for a work table, the latter having an upper surface and at least one side and one end, and the side extension having an upper surface and at least one side and one end, with the side of the work table and the side of the side extension being generally in side-to-side relation, and means for permitting adjustment of the side extension with respect to the work table and for securing the side extension relative to the work table such that the upper surfaces of the work table and the side extension are substantially coplanar and such that the end of the work table and the end of the side extension are generally in line with one another, said means comprising an upper flange and a lowr flange carried by said side extension, each of said flanges having an aperture therein, each said aperture having an aperture side generally parallei to the side of said side extension, said work table having a threaded opening therein in register with each of said apertures in said side extension when said side extension is in generally side-to-side relation with said work table, a threaded fastener received in each of said apertures and being threadably received in a respective said threaded opening in said work table, said aperture side being inclined with respect to the vertical, said aperture side of said upper flange aperture and said aperture side of said lower flange aperture facing in opposite directions with respect to one another such that said side extension can be moved both in vertical and horizontal direction with respect to said work table to a desired position, and such that upon tightening of said fasteners, said fasteners engage their respective said aperture sides of their respective apertures thereby to positively secure said side extension to said work table in its desired vertical and horizontal adjusted position with respect to said work table.

4,677,921

AGRICULTURAL CHEMICAL APPLICATOR

Max A. Brown, 316 Framington Dr., Plantation, Fla. 33317

Filed Feb. 10, 1986, Ser. No. 828,222
Int. Cl.[4] A01C *23/02*
U.S. Cl. 111—6 **5 Claims**



1. A soil treating apparatus comprising:

a first means adapted to be advanced on the ground in rolling contact therewith;

a plurality of hollow spike means connected and mounted on said first means and projecting outwardly therefrom and so constructed and arranged to sequentially penetrate the ground and to withdraw therefrom;

a fluid means connected to said hollow means for providing a source of fluid that flows through said hollow means into the ground;

mounting means connected to said first means for positioning said first means for rolling contact with the ground;

said mounting means including valve means for permitting flow of fluid from said fluid means through mounting means, said valve means and said hollow means to restrict the flow of fluid out through said hollow means;

said valve means including

a relatively fixed member including a passageway, said fixed member connected to said mounting means;

a relatively movable member mounted in intimate, slidable engagement with said relatively fixed member, said relatively movable member connected to and rotatable with said first means and including a plurality of spaced passages in a circular band shaped face adapted to selectively and singularly communicate with said passageway, the areas between said passages being imperforate each of said plurality of spaced passages operably connected to one of said hollow means;

said relatively fixed member including a recess extending only partially through the thickness thereof and coextensive with said passageway;

a plug-like element of substantially the same shape and size of said recess freely movable within said recess, said plug-like element including a passage therethrough communicating with said passageway and adapted to communicate with a selected one of said spaced passages of said relatively fixed member, said plug-like element having a sealing face of a relatively small surface area; and

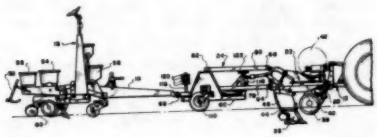
biasing means in said recess operable to continuously urge said sealing face of said plug-like element into engagement with said band shaped face of said relatively fixed element.

4,677,922

SINGLE PASS FRACTURE PLANTING SYSTEM

Dale Shrull, Rte. 5, Box 31A, and Joe W. Hendricks, Rte. 5, Box 179, both of Russellville, Ky. 42276

Filed Mar. 5, 1985, Ser. No. 708,212
Int. Cl.[4] A01C *5/00*
U.S. Cl. 111—52 **7 Claims**



1. A single pass planting system;

a tractor;

sub-soil plow means;

lift connecting means connecting said plow means to said tractor;

planter means having planter bins for delivering seed, insecticide and fertilizer;

hitch means connecting said planter means to said sub-soil plow means for trailing simultanaously with said sub-soil plow means;

said hitch means having drawbar means connected to said planter means, said drawbar means mounted for pivotal movement at one end, the other end being connected to said planter means;

a curved track on said hitch means beneath the end of said drawbar connected to said planter means;

roller means mounted on said drawbar means;

said roller means resting on said curved track supporting and guiding said drawbar when it is allowed to swing from side to side;

hydraulic centering means connected to said drawbar for automatically centering said drawbar after a turn is made and during a planting pass;

said hydraulic centering means comprising a pair of hydraulic cylinder means on either side of said drawbar abutting and holding said drawbar in a centered position and releasing said drawbar for swinging movement when retracted;

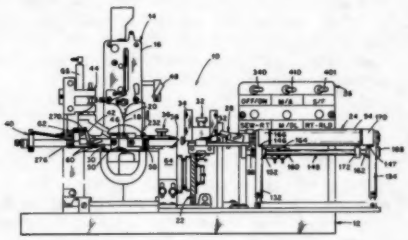
multi-point pivot connecting means connecting said hitch means to said sub-soil plow means whereby said hitch means remains level whenever said sub-soil plow is lifted to make turns.

4,677,923

CARD FEEDING APPARATUS

William A. Tice, 7005 Monarch Ct., Knoxville, Tenn. 37918

Filed Jul. 22, 1986, Ser. No. 888,783
Int. Cl.[4] D05B *3/12*
U.S. Cl. 112—104 **26 Claims**



1. An apparatus for feeding cards from a supply of cards to a work surface of a machine having working mechanisms that operate in a work cycle, comprising:

means for removing a card from the card supply;

means for delivering the card removed from the card supply to a predetermined delivery location adjacent the work surface;

means for holding at least a portion of the card in a spaced relationship above the work surface separately of said delivery means when said delivery means delivers the card to the delivery location;

said delivery means being operable to release the card and retract from the work surface after delivering the card to the holding means; and

means for mounting said holding means in a position proximate to the work surface, said mounting means being operable to position the holding means separately of the working mechanisms of the machine so that the card is held in a desired position relative to the work surface and other working mechanisms.

14. An apparatus for feeding a card from a supply of cards to a sewing station of a sewing machine having a sewing surface and sewing mechanisms that operate in a sew cycle, comprising:

means for removing a card from the card supply;

means for delivering the card removed from the card supply to a predetermined delivery location adjacent the sewing surface;

means for gripping and holding at least a portion of the card a predetermined distance above the sewing surface independently of said delivery means; and

said gripping and holding means being positionable separate from the sewing surface and the sewing mechanisms to

hold the card at a desired position independently from the sewing mechanisms.

26. An apparatus for feeding a card from a card supply to a sewing station having a sewing surface and for sewing the card to a material segment, comprising:

means for removing a card from the card supply;

means for delivering the card removed by said removing means to a delivery location adjacent the sewing station;

means for gripping and holding at least a portion of the card in a spaced relationship above the sewing surface when said delivery means delivers the card to said delivery location, the delivery means being operable to retract when said gripping and holding means grips the card;

means for folding the card as said delivery means delivers the card to the delivery location;

selectively actuable sewing means for sewing the card to the material segment in a predetermined sewing program at the sewing station;

means for actuating said sewing means in response to placement of the material segment in a predetermined position adjacent the card when the card is being gripped and held by said gripping and holding means, said last mentioned means being operable to release the card in response to actuation of said sewing means; and

means for detecting the removal of the material segment from the sewing station after said sewing means has completed the sewing program, said delivery means being operable to deliver a next card to said delivery location in response to said detection means detecting removal of the material segment and its attached card.

4,677,924

SEWING MACHINE HOUSING CONSTRUCTION

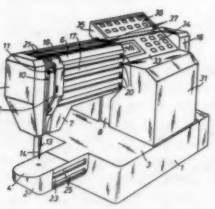
Horst Diener, Ulm; Ernst Albrecht, Hochspeyer, and Erich Willenbacher, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,055

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 8513828

Int. Cl.[4] D05B *73/00, 73/06*

U.S. Cl. 112—258 **9 Claims**



1. A housing for a sewing machine, comprising a base with a material support arm, and upright standard extending upwardly from the base, and a horizontal arm extending outwardly from the standard and overlying said base,

said support arm and said horizontal arm both having opposite flat vertical outer side surfaces,

said horizontal arm having a flat horizontal outer top surface,

said horizontal side surfaces being at right angles to said horizontal top surface,

said side surfaces all having a plurality of substantially parallel indentations therein for in fixing attachment units to said housing.

4,677,925

METHOD OF INITIALLY SETTING A STEPPING MOTOR IN A SEWING MACHINE

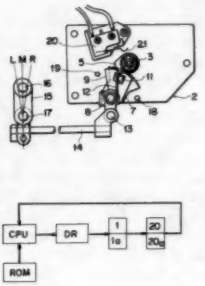
Eiji Murakami; Yasuro Sano, both of Tokyo, and Tohru Hyodo, Kokubunji, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jul. 31, 1985, Ser. No. 761,105

Claims priority, application Japan, Jul. 31, 1984, 59-158582

Int. Cl.[4] D05B *3/02*

U.S. Cl. 112—266.1 **4 Claims**



1. A method for setting a stepping motor to an initial set position at a time that a power supply is applied to an electronic sewing machine incorporating the stepping motor which is used to control under the control of stitch control signals, at least one of a pair of stitch forming elements including a swingable needle and a fabric feeding dog of the sewing machine within a predetermined stitch control range (A) required for producing desired stitches, said stitch control being located within a maximum control range (B) to be rotationally traversed by the stepping motor, said method comprising the steps of: dividing said maximum control range into a predetermined number of steps each corresponding to a rotational step of said stepping motor; providing a plurality of check points (P_5-P_0) among said predetermined number of steps with a predetermined number of steps provided therebetween, to which said stepping motor is rotationally positioned with predetermined energizing phases applied thereto, some of said check points being located within said stitch control range (A) and the others being located outside of said stitch control range; providing a detector (20) between two of said check points located outside of said stitch control range, said detector being responsive to the rotation of said stepping motor to produce an electric signal; steppingly rotating said stepping motor at the time the power supply is applied to the sewing machine in one direction to progressively stop said stepping motor at said check points until said electric signal produced by said detector is checked for and confirmed at one of said two check points; further steppingly rotating said stepping motor with a predetermined number of steps from said one check point towards the opposite extreme check point until the stepping motor rotationally moves through all of said stitch control range in one way and returns to said one check point again; and then steppingly rotating said stepping motor with a predetermined number of steps upon generation of said electric signal of said detector until said stepping motor rotationally comes to one of said check points located within said stitch control range.

4,677,926

POSITIONING DEVICE FOR SEWING MACHINE MAIN SHAFT

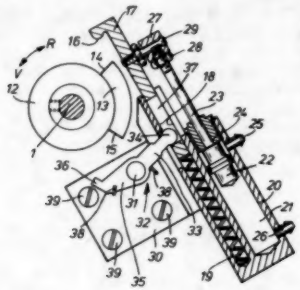
Albert Dusch, and Erich Willenbacher, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industrie Maschinen GmbH, Fed. Rep. of Germany

Filed Jan. 10, 1986, Ser. No. 818,119

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 8500520

Int. Cl.[4] D05B 69/22, 69/08

U.S. Cl. 112—274 5 Claims



1. A drive device for positioning a sewing machine main shaft driven by its own positioning motor into a first predetermined position when the main shaft is stopped in a second position, comprising a movable drive lever having a driver cam, a cam secured to the main shaft for rotation thereby having a cam shoulder motion disposed in the path of movement of said driver cam and a stop portion of said cam spaced circumferentially away from said shoulder portion, drive means associated with said drive lever to move said drive lever to engage said driver cam with said shoulder portion and to rotate said cam and the main shaft, and stop means engageable with said stop portion of said cam with the main shaft in a second predetermined position, said cam including a raised cam portion having a shoulder at one end forming said shoulder portion engageable with the driver cam of said drive lever and an opposite radially extending end defining said stop portion and including a two armed lever pivotally mounted alongside said drive lever and rotated thereby when said drive lever is moved to position a stop in the path of said portion of said cam.

4,677,927

ELECTRONIC FANCY SEWING MACHINE HAVING MEANS FOR ADJUSTING THE DRIVING MEANS OF A CLOTH FEEDER DURING A FEEDING PHASE

Bengt A. Bergvall, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

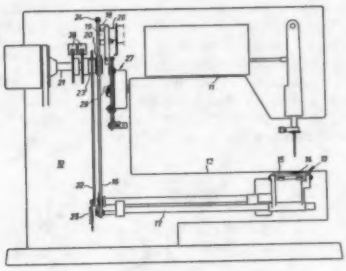
Filed Apr. 4, 1986, Ser. No. 848,390

Claims priority, application Sweden, Apr. 9, 1985, 8501733

Int. Cl.[4] D05B 3/02

U.S. Cl. 112—455 8 Claims

1. In an electronic fancy sewing machine with a stepping motor arrangement, including a stepping motor, for adjustment of the driving means of a cloth feeder wherein the stepping motor arrangement includes an angularly adjustable member, the length of feed of the cloth feeder for each step of the stepping motor being a function of the angular position of the adjustable member; the improvement comprising means for adjusting the adjustable member during a feeding phase to have a first angular position when the cloth feeder engages



cloth being sewn and another angular position when the cloth feeder disengages the cloth.

4,677,928

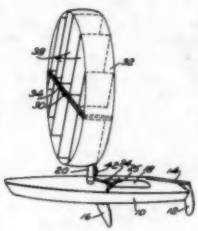
CIRCULAR LINKED ROTATING FOIL ASSEMBLY FOR VESSELS

John G. Hoyt, One Harborview Dr., Newport, R.I. 02840

Filed Mar. 28, 1986, Ser. No. 845,837

Int. Cl.[4] B63H 9/06

U.S. Cl. 114—39 4 Claims



1. A sailing craft having an upright support received for rotation in said craft, a circular structure having an inner surface, a diametrical support extending across the structure and between the inner surface of the circular structure, means connecting the diametral support to said support for rotative movement, a plurality of parallel foils fixedly mounted within said structure between the diametral support and the inner surface of said circular structure, said circular structure providing end plate effect for said foils, control means for controlling the rotative movement of the diametral support and for controlling the rotative position of the upright support.

4,677,929

DESICCANT CARTRIDGE FOR FUEL TANK VENT LINE

William B. Harris, 3222 Orangewood Ave., Los Alamitos, Calif. 90720

Filed Feb. 28, 1986, Ser. No. 834,405

Int. Cl.[4] B63J 2/00

U.S. Cl. 114—211 7 Claims

1. Apparatus for use in a boat having a fuel tank and a vent line connected to the fuel tank for permitting air to enter the fuel tank as fuel is removed from the tank and for permitting air to be exhausted from the fuel tank when the air pressure in the fuel tank exceeds the air pressure of the surrounding atmosphere, the apparatus comprising:

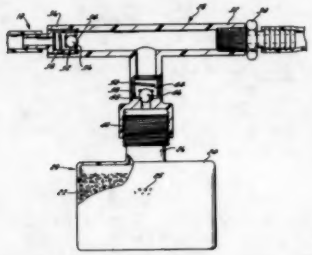
a first check valve providing for air flow from the fuel tank through the vent line to atmosphere and preventing air flow into the fuel tank through the vent line,

means for selectively providing for air flow through the vent line into the fuel tank when the pressure of the atmosphere is greater than the pressure in the fuel tank, the means for selectively providing for air flow through the vent line into the fuel tank including a second check valve, and

means for removing moisture from the air drawn through the second check valve into the vent line and into the fuel tank, the means for removing moisture including

a container connected to the second check valve and

a desiccant housed in the container for removing moisture from air drawn through the container and through the second check valve to the fuel tank and



means for removably connecting said container to said vent line, said means for removably connecting including a connector having a first portion adapted to be connected to a portion of said vent line communicating with said fuel tank, a second portion adapted to be connected to said container, said second portion housing said second check valve, and a third portion adapted to be connected to a portion of said vent line communicating with the atmosphere, said third portion of said connector housing said first check valve.

4,677,930

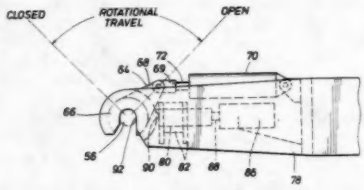
APPARATUS FOR QUICK-RELEASE OF A STORAGE VESSEL FROM A RISER

John E. Ortloff, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Continuation of Ser. No. 760,783, Jul. 31, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 937,450

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—230 **14 Claims**



1. A quick-release connector for securing two offshore mooring sections comprising:

a pin member attached to one end of one mooring section;

a latch member having a hook at one end with an open region therein adapted to engage said pin member and to rotate concentrically about said pin member on a fixed axis substantially corresponding to that of said pin member when in engagement, said latch member being attached to one end of said other mooring section;

a plunger adapted for axial movement between a first position, wherein said plunger is displaced from said open region of said hook, permitting the rotational movement of said latch, and a second position, wherein said plunger advances within said open region of said hook, prohibiting said rotational movement;

means for rotating said latch member about said pin member; and

means for longitudinally displacing said plunger between said first and second positions.

4,677,931

VARIABLE BUOYANCY APPARATUS

Brian L. Buckle, 16 Sunningdale Grove, Colwyn Bay, Clwyd, United Kingdom

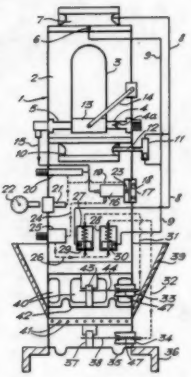
PCT No. PCT/GB85/00013, § 371 Date Sep. 5, 1985, § 102(e) Date Sep. 5, 1985, PCT Pub. No. WO85/03049, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 10, 1985, Ser. No. 774,589

Claims priority, application United Kingdom, Jan. 12, 1984, 8400810

Int. Cl.[4] B63G *8/14*

U.S. Cl. 114—331 **11 Claims**



10. Buoyancy apparatus for carrying a payload to and maintaining the payload within a desired depth range, which apparatus comprises variable buoyancy means, depth sensing means, means for detecting upward motion, means for automatically decreasing the buoyancy of the variable buoyancy means when upward motion is detected, means for automatically increasing the buoyancy to produce upward motion when no upward motion is detected and means for preventing activation of said means for increasing and decreasing the buoyancy until the depth sensing means senses that the payload is at a predetermined depth, wherein the variable buoyancy means comprises a source of pressurised gas and a buoyancy vessel having an inlet provided with an inlet valve and an outlet for said gas provided with an outlet valve.

4,677,932

HANDICAP TURN SIGNAL BAR FOR AN AUTOMOBILE

Joseph Ewing, 8245 Peach Orchard Rd., Baltimore, Md. 21222

Filed Mar. 26, 1986, Ser. No. 844,185

Int. Cl.[4] H01H *3/16, 9/00*

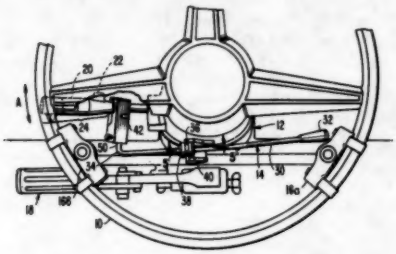
U.S. Cl. 116—35 R **4 Claims**

1. A handicap turn signal bar adapted to be mounted on an automobile's steering column, said steering column terminating in a steering wheel and having a vertically actuated turn signal lever substantially horizontally positioned and extending generally radially from said steering column comprising:

an elongated lever member substantially parallelly disposed with respect to said turn signal lever and pivotably mounted on said steering column, one longitudinal end of said member adapted to be proximate a portion of said

steering wheel and the other longitudinal end of said member disposed in the vertical plane of movement of said turn signal lever;

a split clamp attached to said other longitudinal end of said member and having first and second mating parts that define a varied dimensional through-hole adapted to loosely encircle said turn signal lever, said first mating



part being removably attached to said second mating part such that said split clamp is adapted to be detachable from said turn signal lever; and,

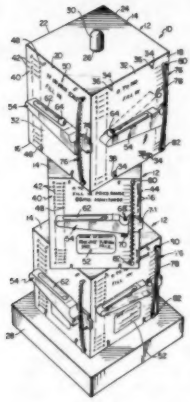
wherein said vertical dimensional through-hole has a cross-sectional area larger than the area of the adjacent portion of said turn signal lever to permit multiple movements of said turn signal lever therein.

4,677,933

STOCK PRICE TRACKING APPARATUS

Thomas B. Rotella, 22 E. 7th St., Clifton, N.J. 07011

Filed Nov. 22, 1985, Ser. No. 801,064
Int. Cl.[4] G09B *19/18;* **G09F** *9/00*
U.S. Cl. 116—313 **22 Claims**



7. Stock price tracking apparatus, comprising:

a base having a cube configuration with four sides;

a first scale on each side of said base;

a second scale on each side of said base;

lever means mounted on each side of said base and releasably retainable in a selected position for monitoring prices of a selected stock to determine one of: (a) when to buy or retain and (b) when to sell or retain said selected stock, each said lever means removably and pivotally mounted on a side of said base along said first scale at a selected position corresponding to a selected price for said stock, each said lever means including pointer means for pointing to an actual price for said stock on said second scale, said lever means being pivoted by an external force about said selected position in accordance with changes in said actual price for said stock, and a channel extending along said lever means; and

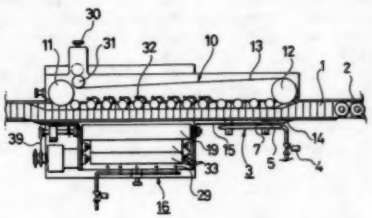
ball means associated with each lever means and movable in the respective channel between a first position and a second position in correspondence with the pivoted position of said lever means for indicating one of: (a) when to buy or retain and (b) when to sell or retain said stock in dependence upon the position of said ball means and upon the relationship between said selected price for said stock on said first scale corresponding to said selected position of said lever means and said actual price for said stock on said second scale pointed to by said pointer means.

4,677,934

COATING DEVICE FOR COLD BOTTLES OR LIKE CONTAINERS

Hironobu Maeda; Seizaburo Kitahara; Haruo Yosimura; Takao Torawaki; Takasi Yaegasi, and Isao Yamaoka, all of Sapporo, Japan, assignors to Sapporo Breweries, Ltd., Japan

Filed Jul. 21, 1986, Ser. No. 888,782
Int. Cl.[4] B05C *1/02, 11/00*
U.S. Cl. 118—58 **5 Claims**



1. A coating device for cold bottles or like containers, characterized in that a conveyer is provided for transporting cold bottles or like containers, a bottle rotating means is provided on one side of line of cold bottles or like containers which are transported by the conveyer, said rotating means comprising a bottle drive belt which moves in parallel to the direction of transportation of the conveyer and in contact with the cold bottles or like containers, an air spraying station and a coating fluid application station are sequentially disposed on other side of the line of containers, compressed air jet nozzles are disposed on at least two levels at the air spraying station, said jet nozzles being directed to predetermined portions to be coated on the containers, coating fluid application rolls are disposed on at least one levels at the coating fluid application station, said application rolls rotating about axes parallel to the direction of transportation of the containers and in contact with the containers, said application rolls being supplied with coating fluid transferred from spray nozzles through sponge rolls which rotate in contact with the application rolls.

4,677,935

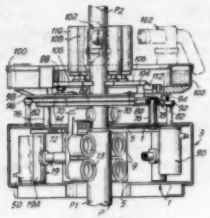
PAINT SPREADER APPARATUS FOR THE MAINTENANCE OF INSTALLED POLES, WITH PAINT EJECTOR AND SPREADING ROLLERS

Gaetano Fusi, and Silvio Meniconi, both of Poggibonsi, Italy, assignors to Sivep di Meniconi Giorgio & C.S.a.s., Siena, Italy

Filed Jun. 26, 1985, Ser. No. 749,288
Claims priority, application Italy, Jun. 27, 1984, 9448 A/84
Int. Cl.[4] B05C *11/02;* **B05B** *1/28, 3/02*
U.S. Cl. 118—108 **5 Claims**

1. An apparatus for painting pole structures comprising in combination a carriage constructed to be movable along the axis of a pole, a carousel rotatably secured to said carriage mounted to revolve around said pole as said carriage moves upwardly and downwardly there along, a paint sprayer located

on said carousel for spraying paint on the circumference of said pole as said carousel revolves, two roller means located symmetrically with respect to the paint sprayer and biased to engage said pole about its circumference as said carousel rotates such that said roller means rotate about their respective axes and spread paint efficiently from said sprayer about the pole including overspray incident directly upon said roller means from said paint sprayer.



4,677,936
PROGRESSIVELY MOVABLE HOLDING DEVICE

Wolfgang Dahlem, Meersburg, Fed. Rep. of Germany, assignor to ZF-Herion-Systemtechnik GmbH, Friedrichshafen, Fed. Rep. of Germany

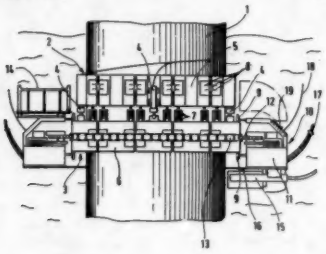
PCT No. PCT/EP85/00445, § 371 Date May 8, 1986, § 102(e) Date May 8, 1986, PCT Pub. No. WO86/01791, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 4, 1985, Ser. No. 865,558

Claims priority, application Luxembourg, Sep. 12, 1984, 84/00278

Int. Cl.[4] B05B *15/00*

U.S. Cl. 118—307 **16 Claims**



1. A progressively movable holding device (**2, 3**) especially utilizable as tool or implement carrier (**10**) for treatment and/or inspection processes or workpieces (**1**) of larger or extended surfaces or of difficult access such as cast-iron pipes,

having a number, adjustable to a predetermined processing length, of variably movable individual elements supported against the surface or contour of said workpiece (**1**),

upon which elements both said holding device (**2, 3**) itself and said tool or implement carrier (**10**) are separately transportable by remote control to alternating working positions;

wherein tightening elements (**4, 12**) actuatable by auxiliary energy provide for progressive movement from one working position to the next,

and said tool carrier (**10**) is conveyable along said individual elements, characterized in that

said individual elements consist of link plates (**5, 6**) retained together in releasable hinges and joined together to form two link chains (**2, 3**) at variable distance,

said link plates (**5, 6**) are each separately held at a constant distance in respect to said workpiece,

being themselves directly designed as double rails (**26**) for said tool or implement carrier (**10**) movable therealong and

there being provided for progressive movement a partly transitory loosening and retightening of at least a few link plates (**5, 6**) by means of peripheral tightening elements (**4, 32**) actuatable by remote control.

4,677,937
APPARATUS FOR HOLDING ELECTRIAL OR ELECTRONIC COMPONENTS DURING THE APPLICATION OF SOLDER

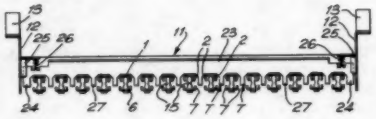
Sim Ah Tee, Singapore, Singapore, assignor to Sun Industrial Coatings Private Ltd., Singapore

Filed Jul. 30, 1985, Ser. No. 760,585

Claims priority, application United Kingdom, Jul. 30, 1984, 8419420

Int. Cl.[4] B05D *5/12*

U.S. Cl. 118—500 **8 Claims**



1. A carrier for a plurality of electrical or electronic components comprising a frame in which is provided a plurality of parallel tracks for receiving the components, wherein the tracks are formed by a plurality of parallel, laterally spaced, axially extending upper support members each of which define a pair of parallel, axially extending upper rails having downardly facing portions and a plurality of parallel, laterally spaced, axially extending lower support members aligned with and vertically spaced from the upper support members each of the lower support members defining a pair of parallel, axially extending lower rails having upwardly facing portions, whereby each track is defined by four rails and is situated between two adjacent upper support members and their aligned lower support members.

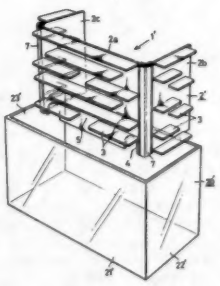
4,677,938
GYMNASTIC DEVICE FOR SMALL PET ANIMALS

Kazutoshi Tominaga, Higashi Osakashi, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Higashi Osakashi, Japan

Filed Nov. 1, 1985, Ser. No. 793,962

Int. Cl.[4] A01K *15/02*

U.S. Cl. 119—29 **4 Claims**



1. A gymnastic device for use in combination with a breeding box having side walls for keeping small pet animals, the device comprising:

a first, a second, and a third plate associated with respective side walls of the breeding box, at least one plate having at least one opening therein along an edge, said second and third plates being arranged perpendicular to said first plate so that each of said plates is arranged to face the respective breeding box side wall; and

a plurality of plate members associated with each of said first, second and third plates and arranged substantially horizontally thereon facing the respective breeding box side wall, each of said plate members being shorter in length than the associated breeding box side wall and arranged on each of said first, second and third plates with spaces interposed between adjacent plate members, wherein each space is large enough to allow the animals to pass therethrough.

4,677,939

HEAT EXCHANGER AND APPLICATION TO A FLUID HEATING APPARATUS, PARTICULARLY A DOMESTIC HOT WATER ACCUMULATOR

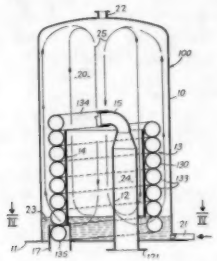
Jean-Paul Henault, Bourseville; Albert Drapier, Saint Maur; Guy Grochowski, Deuil la Barre, and Alain Meslif, Luzarches, all of France, assignors to Gaz de France and Societe Industrielle Auer S.A., both of, France

Filed Jan. 21, 1986, Ser. No. 820,988

Claims priority, application France, Jan. 21, 1985, 85 00803

Int. Cl.[4] F22B *5/00*

U.S. Cl. 122—17 **11 Claims**



1. In an apparatus for heating a fluid, particularly a domestic hot water accumulator, comprising a heating enclosure supplied in its lower part with fluid to be heated, a combustion chamber comprising a burner at one of its ends and extending on the side opposite the burner inside the enclosure, a heat exchanger tube disposed inside the enclosure to constitute a contra-flow heat exchanger, which tube is hermetically connected to the outlet of the combustion chamber and opens out in a fume evacuation device located in the lower part of the enclosure in order to evacuate the fumes to outside the heating apparatus, and means for taking heated fluid in the upper part of the enclosure, the improvement wherein

the heat exchanger tube comprises an originally flexible, tight, ringed metal tube;

the ringed tube is disposed spirally substantially in the lower third of the enclosure,

adjacent turns of the ringed tube are tangentially in contact with one another in order to form a compact exchanger; and

the flexible ringed tube is wound around a rigid support which comprises a cylindrical surface surrounding that part of the combustion chamber located inside the enclosure.

4,677,940

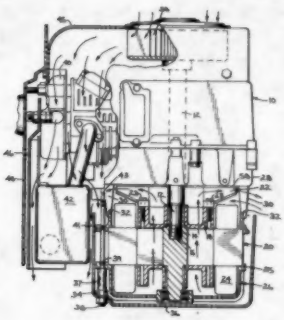
COOLING SYSTEM FOR A COMPACT GENERATOR

Jeffrey L. Bracht, Sheboygan; Martin W. Heinrich, Cedar Grove; Richard D. van Maaren, Sheboygan, and Richard L. Sleder, Howards Grove, all of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Aug. 9, 1985, Ser. No. 764,869

Int. Cl.[4] F02B *63/04*

U.S. Cl. 123—2 **4 Claims**



1. A compact generator unit, comprising:

A. an internal combustion engine, including an engine housing and a vertical shaft; and

B. a generator which lies below said engine and is driven by said vertical shaft, said generator including a generator fan which is a radial fan located on the top of said generator; and a generator housing; wherein said engine housing and said generator housing are coupled together at points outside of the perimeter of said generator fan such that said engine is directly above said generator fan and such that said generator fan draws air up through said generator and across the bottom of said engine, thereby cooling both said generator and said engine.

4,677,941

ELECTRICAL COOLING FAN

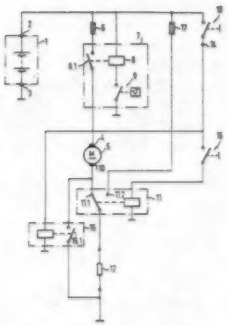
Erich Kurz, Wiernsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 7, 1985, Ser. No. 763,265

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429052

Int. Cl.[4] F01P *5/02*

U.S. Cl. 123—41.12 **15 Claims**



1. An electric cooling fan arrangement having an electric

motor for engines such as for internal combustion engines of motor vehicles, wherein said electric motor is independently controllable by a thermostatic switch means which activates upon the engine temperature reaching a first specified threshold temperature, said arrangement comprising:

an electric resistance means detachably connected in series to said electric motor for reducing the speed of said electric motor during decreased cooling air requirements of said engine,

wherein said resistance means includes a rear window heating unit.

4,677,942

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

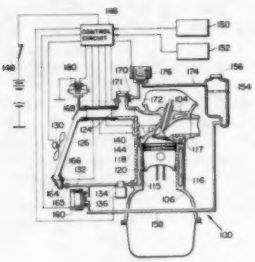
Filed Aug. 6, 1984, Ser. No. 687,780

Claims priority, application Japan, Aug. 9, 1983, 58-145469; Aug. 9, 1983, 58-145468

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] F01P *3/22*

U.S. Cl. 123—41.21 **19 Claims**



1. In a method of cooling a device, the steps of:

boiling a liquid coolant in a coolant jacket to produce a vapor;

condensing the vapor produced in said boiling step, in a radiator;

increasing the boiling point of said liquid coolant by reducing the heat exchange capacity of said radiator in the event that the rate of condensation exceeds a predetermined maximum value and the boiling point of said liquid coolant falls below a predetermined minimum value,

wherein said coolant jacket and said radiator form part of a cooling system, and including the step of selectively sealing the cooling system to selectively permit pressure in said system to vary above or below atmospheric.

14. In a method of cooling a device, the steps of:

boiling a liquid coolant in a coolant jacket to produce a vapor;

condensing the vapor produced in said boiling step, in a radiator;

sensing the level of coolant in said coolant jacket;

pumping liquid coolant from said radiator to said coolant jacket in response to said level sensing step;

sensing a difference in pressure between pressure in said radiator and atmospheric pressure; and

reducing the heat exchange capacity of said radiator in the event that the sensed difference in pressure indicates that the rate of condensation exceeds a predetermined maximum value.

4,677,943

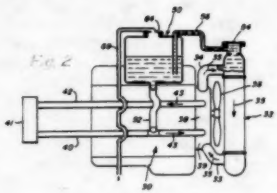
AUTOMOTIVE NON-PRESSURE COOLING SYSTEM

Alan A. Skinner, 19 Hillcrest Ave., Brockton, Mass. 02401

Filed Mar. 3, 1986, Ser. No. 835,638

Int. Cl.[4] F01P *11/02*

U.S. Cl. 123—41.27 **12 Claims**



1. A non-pressure automotive engine cooling system comprising; a radiator containing a liquid coolant, coupling hoses that intercouple the radiator to the engine, pump means associated with the engine for circulating coolant through the engine and radiator, said pump means having a suction side, a radiator cap sealed on the radiator, an expansion tank disposed in the engine compartment, vent means on the tank for venting the tank to atmosphere, a coupling tube disposed between the radiator below the radiator cap and the expansion tank to enable free flow of the coolant under expansion from the radiator to the expansion tank, said radiator cap sealing to the radiator but providing a substantially non-pressure and unimpeded fluid path from the radiator to the coupling tube, a return line coupled from the expansion tank to the suction side of the pump means, said radiator having a gooseneck with the radiator cap sealably engaged with the gooseneck, an outlet port from the top of the radiator to which the coupling tube is connected, said outlet port being continuously open and unblocked by said radiator cap to provide free fluid flow from the radiator to the expansion tank over the entire operating temperature range, said radiator cap sealing only at the top of the gooseneck, and means for supporting said expansion tank at a position at a height corresponding to the top of the radiator whereby under normal temperature range operating conditions the liquid level line is substantially the same in both the radiator and the expansion tank.

4,677,944

FUEL SUPPLYING DEVICE FOR INTERNAL COMBUSTION ENGINE

Selichi Nishimura, and Hidekazu Takayasu, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

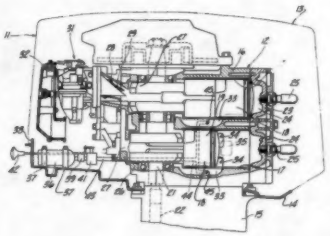
Continuation of Ser. No. 650,364, Sep. 13, 1984, abondoned.

Filed Jun. 9, 1986, Ser. No. 873,105

Claims priority, application Japan, Sep. 17, 1983, 58-170615

Int. Cl.[4] F02B *43/00*

U.S. Cl. 123—73 B **8 Claims**



1. In a fuel feeding system for an outboard motor having an internal combustion engine having a combustion chamber and

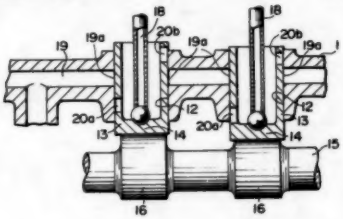
of the type operated on a liquid fuel and having a charge forming device and associated induction system for running of said engine, and a protective cowling encircling said outboard motor, the improvement comprising a source of pressurized gaseous fuel contained within said protective cowling and means for selectively supplying said gaseous fuel to said engine to an area that communicates with said combustion chamber only during a portion of the cycle of engine operation.

4,677,945

MECHANICAL VALVE LIFTER CONSTRUCTION ADAPTED FOR MECHANICAL/HYDRAULIC VALVE LIFTER INTERCHANGABILITY

Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 26, 1985, Ser. No. 780,431
Claims priority, application Japan, Jan. 18, 1985, 60-007065
Int. Cl.[4] F01L *1/14*
U.S. Cl. 123—90.48 **3 Claims**



1. A mechanical valve lifter construction, for an engine formed with a valve lifter bore with a lubricant supply opening, positioned at an axially intermediate point therealong, to which is communicated a passageway to which lubricating oil is supplied under pressure, said engine comprising means for reciprocating a valve lifter in said valve lifter bore along a determinate stroke, comprising:

a generally cup shaped valve lifter, with an outer cylindrical surface slidably inserted in said valve lifter bore and with an internal hollow, formed with a generally radially extending lubricant escape hole through its side from its said internal hollow to its said outer cylindrical surface;

said lubricant escape hole opening to said outer cylindrical surface of said valve lifter at such a position that, when said valve lifter is slidably inserted in said valve lifter bore and is reciprocated therein by said reciprocating means, said lubricant escape hole does not come into register with said lubricant supply opening at any time during the movement of said valve lifter along its said determinate stroke.

4,677,946

APPARATUS FOR POSITIONING TWO SENSOR DEVICES

Henry J. Tamagne, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

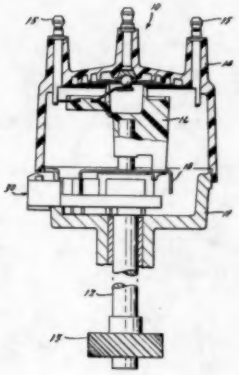
Division of Ser. No. 739,344, May 30, 1985, Pat. No. 4,635,353.
This application Jun. 16, 1986, Ser. No. 874,723
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—146.5 A **5 Claims**

1. A mount for two Hall sensors for mounting on a distributor at a predetermined desired rotational position, said mount including:

a primary carrier for supporting a first Hall sensor and having a first alignment means for rotationally positioning the first Hall sensor with respect to a distributor and establishing the firing point of the first Hall sensor;

a secondary carrier for supporting a second Hall sensor, said secondary carrier including a second alignment means for indicating the firing point of the second Hall sensor;

said primary carrier including a third alignment means for establishing the rotational position of the secondary carrier, and thus, in turn, the second Hall sensor with respect to the primary carrier;



said second and third alignment means being coupled to another so as to mount said secondary carrier to said primary carrier and fix the relative rotational positions between the firing points of said first and second Hall sensors

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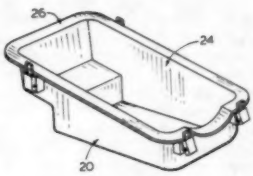
4,677,947

CLAMPED, READILY-REMOVABLE OIL PAN WITHOUT DRAIN HOLE

Beaumont Bousquet, 20 Lesgay Crescent, Willowdale, Canada M2J 2H8

Filed Jun. 30, 1986, Ser. No. 880,183
Int. Cl.[4] F02F *7/00*
U.S. Cl. 123—195 C **6 Claims**



1. In combination in an internal combustion engine:

an oil pan adapted for readily-removeable connection to an underside of the engine; and

a plurality of readily-releasable clamping means; wherein:

the oil pan is adapted to contain a lubricating fluid;

the oil pan has an upper opening having an oil pan periphery;

the oil pan has no outlet for removing lubricating fluid such that the oil pan must be removed from the underside of the engine in order to replace lubricating fluid in the oil pan;

the underside of the engine has a lower opening having an underside periphery;

the underside periphery is substantially the same size, shape and configuration as the size, shape and configuration of the oil pan periphery, such that when in combination the oil pan periphery is in contact with substantially all portions of the underside periphery;

each clamping means applies a clamping force in a direction substantially perpendicular to a line defined as being the points where the oil pan periphery contacts the underside

periphery in the region proximate to the clamping means; and

the clamping force of each clamping means is obtained by means other than bolts or screws.

4,677,948

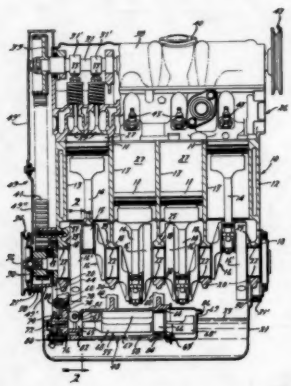
LUBRICATING SYSTEM FOR AN ENGINE BALANCING DEVICE

Cornell Candea, Clawson, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 29, 1986, Ser. No. 868,904

Int. Cl.[4] F02B *75/06*

U.S. Cl. 123—192 B **2 Claims**



1. For an internal combustion engine having an engine block with cylinder bores therein, pistons, connecting rods and a crankshaft with the pistons and associated connecting rods movable in the parallel cylinder bores of the engine block when the crankshaft rotates thereby generating a periodic unbalance force with each half-rotation of the crankshaft, an improved balancing device to generate an opposing force to effectively cancel the unbalance forces of the pistons and connecting rods, comprising: the balancing device including a housing enclosure located beneath the crankshaft and block, the housing having a hollow interior and a pair of apertures at either end thereof; a pair of elongated balance shafts extending in parallelism through the hollow interior with adjacent end portions projecting through the apertures thereby supporting the balance shafts for rotation in the housing; the housing being supported by the block and beneath the crankshaft and with the balance shafts in parallelism with the crankshaft axis; means attached to the housing forming an enclosure having an interior enclosing adjacent end portions of the balance shafts which project from an end of the housing; means for oil lubricating the shaft mounting apertures and means for discharging oil from the interiors of the housing and the enclosure means; a vacuum breaking air bleed means in an upper portion of the enclosure means for facilitating the discharge of oil from the enclosure interior.

4,677,949

SCROLL TYPE FLUID DISPLACEMENT APPARATUS

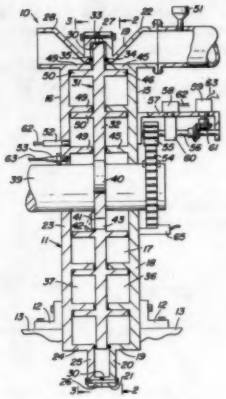
Robert K. Youtie, 200 Uxbridge Ave., Cherry Hill, N.J. 08034

Filed Aug. 19, 1985, Ser. No. 767,114

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—235 **5 Claims**

1. A scroll type apparatus comprising a casing having a gas inlet chamber and a gas exhaust chamber in side by side relation, a fixed compression spiral wrap in said inlet chamber facing toward said exhaust chamber, a fixed expansion spiral wrap in said exhaust chamber facing toward said inlet chamber, orbital carrier means interposed between and having opposite sides facing toward respective fixed spiral wraps, carrier means mounting means mounting said carrier means for orbital movement relative to said fixed spiral wraps, a moveable compression spiral wrap on one side of said carrier means interfitting with and orbitally moveable relative to said fixed compression spiral wrap, a moveable expansion spiral wrap on the other side of said carrier means interfitting with and orbitally moveable relative to said fixed expansion spiral wrap, said compression spiral wraps being oriented in one angular direction to compress gas in said inlet chamber and



displace compressed gas inwardly upon said orbital carrier means movement, and said expansion spiral wraps being oriented in the other angular direction to expand gas and displace it radially outwardly into said exhaust chamber upon orbital carrier means movement, port means centrally of said carrier means communicating between said inlet and exhaust chambers for passing compressed gas from said compression spiral wrap to said expansion spiral wraps, and combustion charge means communicating with said expansion spiral wraps for ignition to expand gas in said expansion spiral wraps and drive said carrier and mounting means.

4,677,950

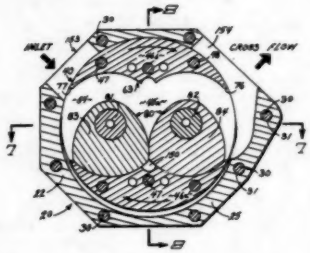
ROTARY CAM FLUID WORKING APPARATUS

Norm Buske, HCR 11 - Box 17, Davenport, Wash. 99122

Filed Jan. 10, 1986, Ser. No. 818,595

Int. Cl.[4] F02B *53/00;* **F04C** *2/00*

U.S. Cl. 123—241 **25 Claims**



18. An internal combustion engine comprising:

a housing having housing walls which substantially enclose a housing interior; said housing further including at least one intake passageway and at least one exhaust passage-

way through which at least one working fluid passes to and from said housing interior;

a rotor mounted within the housing interior for rotation about a rotor axis of rotation which extends longitudinally within said housing; said rotor having exterior surfaces which are substantially cylindrical about said rotor axis of rotation; said rotor further including interior surfaces having cylindrically concave interior surface portions extending longitudinally within said rotor to define a rotor interior; said rotor further having at least one rotor port communicating the rotor interior with the housing passageways to allow passage of a working fluid into and from said rotor interior;

a plurality of cam structures mounted substantially within the rotor for rotation with respect thereto; said cam structures including cam surfaces which are convex; exterior surfaces of said cam structures each including a major curvature surface which is at least partially defined by an associated major radius of curvature centered upon the associated axis of rotation of the cam structure; each major radius of curvature being greater than one-half of a separation distance existing between the associated axis of rotation of the cam structure and adjacent axes of rotation of adjacent cam structures; and

cam synchronizing means for maintaining said cam structures in approximately parallel relative angular orientations with respect to said housing as the rotor rotates and the cam structures revolve about each other.

4,677,951

FUEL INJECTION PUMP

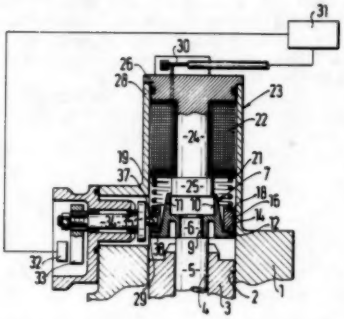
Werner Pape, Magstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,195

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501379

Int. Cl.[4] F02D *41/40*

U.S. Cl. 123—357 **11 Claims**



1. A fuel injection pump having a housing comprising, a rotary distributor for determining injection duration and for injection timing, said rotary distributor positioned in a bore in said housing, an associated electromagnetic final control element and a control unit therefor, said electromagnetic final control element arranged to adjust said distributor counter to a restoring force, a transducer for detecting the axial position of said distributor, said transducer being connected to said electric control unit, means firmly joined to one end of said distributor, said means having an outer circumference including a collar, an intermediate ring supported on said collar, spring means urging said intermediate ring against said collar and means carried by said intermediate ring, said last named means adapted to transmit signals to said transducer.

4,677,952

UNIT FOR COUPLING A DISPLACEABLE OPERATING BAR OR SHAFT WITH A REGULATING MEMBER, IN PARTICULAR WITH AN ADJUSTING ROD OF A FUEL INJECTION AGGREGATE IN AN INTERNAL COMBUSTION ENGINE

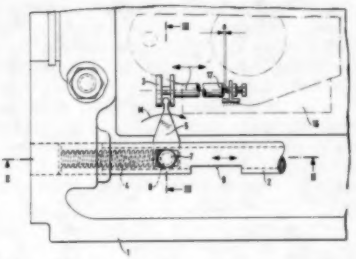
Tomas Visek; Gottfried Czaby, and Georg Nowotny, all of Steyr, Austria, assignors to Steyr- Daimler-Puch AG, Vienna, Austria

Filed Nov. 26, 1985, Ser. No. 801,738

Claims priority, application Austria, Nov. 27, 1984, 3750/84; Dec. 11, 1984, 3918/84

Int. Cl.[4] F02M *59/28*

U.S. Cl. 123—372 **9 Claims**



1. A unit for coupling a displaceable operating member with at least one regulating member of a fuel injection aggregate of an internal combustion engine, comprising

a unit casing of a fuel injection aggregate, said unit casing having at least one bore,

a displaceable operating member having first and second transverse bores, said first transverse bore being associated with said bore of said unit casing,

a regulating member,

a positioning pin being insertable into said bore of said unit casing and said first transverse bore of said operating member for securing said operating member against displacement relative to said unit casing, said positioning pin being set during an initial step of assembling said regulating member with said operating member,

a cam engaging said regulating member,

abutting means for limiting the movement of said regulating member in one direction,

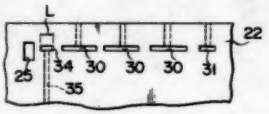
screw means for firmly clamping said cam on said operating member and into engagement with said regulating member, said screw means extending through said second transverse bore in said operating member, said cam projecting transversely from said operating member, said screw means having an external threading, and

nut means located on said cam, said nut means having an internal threading for engaging said external threading of said screw means, said internal threading of said nut means being self-locking and thereby causing an increased screwing-down momentum, the direction of force exerted on said cam by said screwing-down momentum of said screw means corresponding to the direction of movement of said regulating member toward said abutting means.

4,677,953
FUEL INJECTION SYSTEM FOR INTERNAL-COMBUSTION ENGINES

Horofumi Kizawa, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,719
Claims priority, application Japan, Oct. 26, 1983, 58-164623[U]; Oct. 31, 1983, 58-167627[U]
Int. Cl.[4] F02M *41/06*
U.S. Cl. 123—450 6 Claims

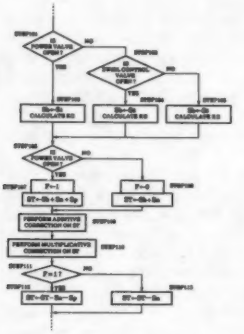


1. A fuel injection system for internal combustion engines, comprising a rotary valve device which is driven in synchronism with a came shaft of the engine to distribute high pressure fuel to unit injectors of the engine and has a rotary spool rotating in a housing having fuel supply port means and fuel metering groove means in said housing and disposed in a plane perpendicular to the axis of said spool for metering the amount of fuel injection each formed on the circumference thereof, characterized in that said fuel metering groove means includes a plurality of independent divisions, one for each unit injector.

4,677,954
METHOD AND SYSTEM INCORPORATING ZERO-CORRECTION FOR FUEL SUPPLY CONTROL FOR INTERNAL COMBUSTION ENGINE

Toshimitsu Ito, and Akio Okamoto, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 7, 1986, Ser. No. 837,403
Claims priority, application Japan, Mar. 11, 1985, 60-047868
Int. Cl.[4] F02D *41/00*
U.S. Cl. 123—478 30 Claims



1. A method for controlling an internal combustion engine fuel supply system comprising:

(a) an intake passage;

(b) a main fuel conduit which supplies fuel into said intake passage to be mixed with air flowing therethrough to provide air-fuel mixture for said internal combustion engine;

(c) means for regulating fuel flow through said main fuel conduit through a range of values according to the value of a main fuel conduit control signal, the fuel flow provided through said main fuel conduit when said main fuel conduit control signal is substantially zero being a determinate basic value substantially greater than zero;

(d) a power fuel conduit which selectively supplies fuel into said intake passage to be mixed with said air flowing therethrough; and:

(e) a means for regulating said power fuel conduit to be either open or closed, according to the value of a power fuel conduit control signal; comprising the steps of:

(f) when said power fuel conduit is closed:

(f1) determining a basic value Sb for said main fuel conduit control signal according to engine operational parameters;

(f2) adding a value Sn to said basic value Sb;

(f3) applying a multiplicative correction to the result of step f2; and:

(f4) determining the value for said main fuel conduit control signal by subtracting said value Sn from the result of step f3; and:

when said power fuel conduit is open:

(g1) determining a basic value Sb for said main fuel conduit control signal according to engine operational parameters;

(g2) adding said value Sn and a value Sp to said basic value Sb;

(g3) applying a multiplicative correction to the result of step g2; and:

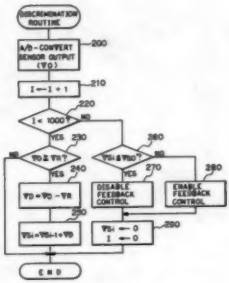
(g4) determining the value for said main fuel conduit control signal by subtracting said value Sn and said value Sp from the result of step g3;

(h) where said value Sn represents the value of said main fuel conduit control signal which would be required, in a virtual sense, for providing said determinate basic main fuel conduit flow value from a zero flow value, and said value Sp represents the incremental value of said main fuel conduit control signal which would be required to increase the fuel flow amount through said main fuel conduit by an amount corresponding to the fuel flow through said power fuel conduit when it is open.

4,677,955
METHOD AND APPARATUS FOR DISCRIMINATING OPERATIVENESS/INOPERATIVENESS OF AN AIR-FUEL RATIO SENSOR

Mitsunori Takao, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 30, 1985, Ser. No. 792,929
Claims priority, application Japan, Nov. 30, 1984, 59-254431
Int. Cl.[4] F02D *41/22*
U.S. Cl. 123—489 9 Claims



1. An apparatus for discriminating operativeness/inoperativeness of an air-fuel ratio sensor which produces an output signal indicative of air-fuel ratio, provided in an exhaust passage of an internal combustion engine so that an air-fuel ratio of mixture to said engine is feedback-controlled in response to an

output signal of said air-fuel ratio sensor, said apparatus comprising:

means for comparing the output signal of said air-fuel ratio sensor with a predetermined reference level;

means for calculating a difference between the output signal of said air-fuel ratio sensor and said predetermined reference level;

means for integrating, for a predetermined interval of time, the difference calculated by said calculating means to produce an integration value;

means for comparing the integration value produced by said integrating means with a predetermined discrimination reference, so that operativeness/inoperativeness of said air-fuel ratio sensor is discriminated in response to a comparison output of said comparing means; and

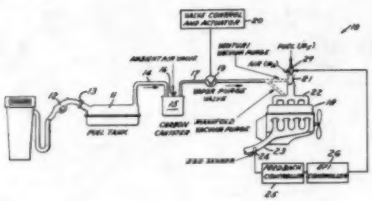
means for enabling said difference calculating means to calculate said difference in response to an output of said output signal comparing means indicative of an attainment of the output signal of said air-fuel ratio sensor at the predetermined reference level.

4,677,956

SOLENOID DUTY CYCLE MODULATION FOR DYNAMIC CONTROL OF REFUELING VAPOR PURGE TRANSIENT FLOW

Douglas R. Hamburg, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 19, 1985, Ser. No. 756,611
Int. Cl.[4] F02M *25/08*
U.S. Cl. 123—520 **2 Claims**



1. A method of controlling purging of fuel vapors from a vapor canister storing fuel vapors from the fuel tank of an internal combustion engine to the intake of an internal combustion engine, including the steps of:

inducting a mixture of fuel and inlet air into the internal combustion engine;

providing a purge command signal during the time desired to purge the canister of vapors;

inducting purge air through the canister to induct a mixture of purge air and fuel vapor from the canister into the internal combustion engine in response to said purge command signal;

sensing an output parameter in the exhaust of said internal combustion engine indicative of the air/fuel ratio of the internal combustion engine;

regulating said mixture of fuel and inlet air in response to said output sensing to provide an air/fuel ratio of inlet air and purge air to fuel vapor and fuel within a predetermined range; and

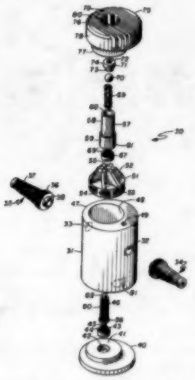
modulating the purge flow mixture of purge air and fuel vapor in response to initiation of said purge command signal, said modulating enabling gradual increase of purge flow from no purge flow during a predetermined transient time at the beginning of said purge command signal so that said regulating step is able to prevent the air/fuel ratio from exceeding said predetermined range during said predetermined transient time, and said predetermined transient time being approximately equal to the propogation time of a mixture of air and fuel through the same engine.

4,677,957

CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Alvaro G. Valencia, Armenia, Colombia, assignor to Turbo's Investigacion Energetica, Colombia

Filed Feb. 4, 1986, Ser. No. 825,906
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—572 **10 Claims**



1. In a control system for use in internal combustion engines, having a crankcase and having an intake manifold, comprising:

a main body having a throughbore therein offset from the central axis thereof;

an inlet leading into the interior of said throughbore, said inlet being connected to the crankcase;

an outlet in fluid communication with the interior of said throughbore, said outlet being connected to the intake manifold;

a shaft mounted for rotation in said bore;

a turbine having a plurality of blades thereon keyed to said shaft for rotation therewith, said turbine having turbine rotating means disposed in a position wherein fluids entering said throughbore from said inlet impel on said turbine rotating means thereby rotating said turbine; and

spring biased ambient air valve means mounted at the top of said main body having an inlet communicating with the interior of said throughbore with a spring biased ball mounted in said inlet adapted, in a first position, to admit ambient air into the interior of said throughbore and, in a second position, prevent any fluids in said throughbore from exiting out of said inlet.

4,677,958

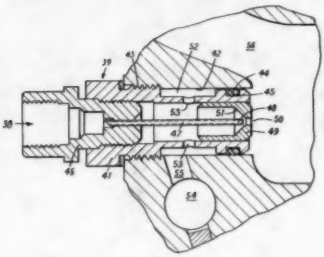
FUEL DELIVERY TO INTERNAL COMBUSTION ENGINES

Robert J. Gayler, Mersham, England, assignor to Piper FM Limited, Ashford, England

Division of Ser. No. 486,288, filed PCT GB82/00199, Jul. 7, 1982, published as WO83/00191, Jan. 20, 1983, Pat. No. 4,617,898. This application Feb. 18, 1986, Ser. No. 831,037
Claims priority, application United Kingdom, Jul. 7, 1981, 8120988; Sep. 8, 1981, 8127132; Oct. 29, 1981, 8132624; PCT Int'l Appl., Jul. 7, 1982, PCT/GB82/00199
Int. Cl.[4] F02M *69/08*
U.S. Cl. 123—585 **11 Claims**

5. Apparatus for delivering successive charges of fuel to a working chamber of an internal combustion engine from a liquid fuel supply line having a flow rate therethrough which is controlled in accordance with operating conditions of the engine, comprising a nozzle mounted in a side wall of an inlet duct leading to a combustion chamber and having an engine throttle associated therewith, the inlet duct communicating with the combustion chamber through an openable inlet valve,

the nozzle comprising a small bore fuel delivery tube connected to the supply line and mounted in an air passage connected to receive air from a supply bypassing the engine throttle, the air passage being convergent to an outlet for delivering fuel and air into the inlet duct, characterized in that the delivery tube is continuously connected to the supply line and in



that the pressure maintained in the supply line in relation to the dimensions of the delivery tube is insufficient to discharge a charge of fuel from the delivery tube in the absence of air movement in the air passage so that a charge of fuel is delivered by the delivery tube only during induction of a charge of air into the combustion chamber.

4,677,959

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

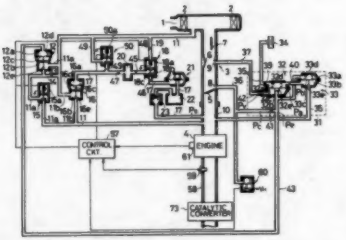
Norio Suzuki, Tokyo; Akira Watabe, Fujimi, and Kazunari Yamashita, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,394

Claims priority, application Japan, May 21, 1985, 60-109034

Int. Cl.[4] F02M *23/08*

U.S. Cl. 123—587 **5 Claims**



1. An air intake side secondary air supply system for an internal combustion engine having an intake air passage with a carburetor and a throttle valve, comprising:

a first secondary air supply passage leading to the intake air passage downstream of the throttle valve;

a second secondary air supply passage leading to the intake air passage downstream of the throttle valve;

air/fuel ratio detection means for detecting an air/fuel ratio of a mixture supplied to the engine from a composition of an exhaust gas of the engine;

an open/close valve disposed in said first secondary air supply passage which is operated to open only when said detection means detect a rich air/fuel ratio;

an air control valve having a pressure chamber and disposed in said second secondary air supply passage, for varying a sectional area of a flow through said second secondary air supply passage in response to a magnitude of a pressure applied in said pressure chamber;

a first control pressure source for generating a first control pressure for opening said air control valve;

a second control pressure source for generating a second control pressure for closing said air control valve;

engine operation detection means for detecting at least a state of engine operation in which a supply of said air intake side secondary air in response to a result of a detection operation of said air/fuel ratio detection means is to be stopped, and for generating an engine operation detection signal upon detection of said state of engine operation; and

pressure control means for gradually supplying said first control pressure to said pressure chamber so as to gradually increase said sectional area when said air/fuel ratio detection means detect the rich air/fuel ratio, and supplying gradually said second control pressure to said pressure chamber so as to gradually decrease said sectional area when said air/fuel ratio detection means detect a lean air/fuel ratio and said engine operation detection signal is not produced, and rapidly supplying said second control pressure to said pressure chamber so as to rapidly close said air control valve when said engine operation detection signal is produced by said engine operation detection means.

4,677,960

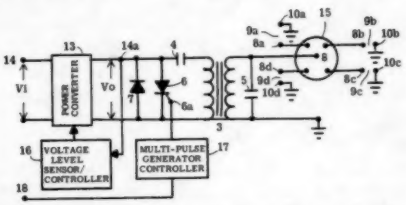
HIGH EFFICIENCY VOLTAGE DOUBLING IGNITION COIL FOR CD SYSTEM PRODUCING PULSED PLASMA TYPE IGNITION

Michael A. V. Ward, Lexington, Mass., assignor to Combustion Electromagnetics, Inc., Arlington, Mass.

Filed Dec. 31, 1984, Ser. No. 688,030

Int. Cl.[4] F02P *3/08, 15/08;* **H01F** *27/30*

U.S. Cl. 123—598 **34 Claims**



1. In an electrical ignition system including a transformer with primary and secondary windings wound about a magnetic core material and an input capacitor of capacitance **C1** connected to the primary winding for storing and discharging electrical energy, and secondary winding connected to a spark gap providing a total secondary output capacitance **C2**, the improvement comprising:

the transformer winding turns ratio N being constructed between 25 and 55 to provide a peak secondary output voltage **V2** for an input voltage **V1** to which capacitor **C1** is charged, where **V2** is given by **V2=k1*N*V1*VP**, where **k1** is the coil coupling coefficient and **VP** is the voltage doubling parameter defined according to **VP=2/[1+(N**2)*C2/C1]**, and the system is constructed and arranged so that the voltage doubling parameter **VP** is greater than 1.6.

4,677,961

CLAY PIGEON LAUNCHER

James A. Allison, 3701 N. Mio Rd., Rose City, Mich. 48654

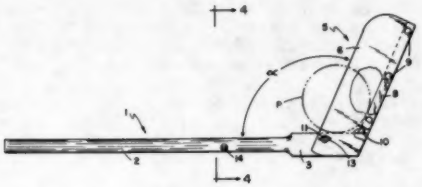
Filed Nov. 12, 1985, Ser. No. 797,037

Int. Cl.[4] F41J *9/18*

U.S. Cl. 424—5 **6 Claims**

1. A launcher for a projectile such as a clay pigeon comprising a carrier having a base flanked by a pair of spaced, parallel walls forming a trough open along one side at both ends, said

walls projecting beyond said base at one end of said body; an elongate handle straddled by the projecting walls of said carrier; and means connecting said projecting walls to said handle



with said base abutting said handle, said base and said handle having therebetween an included angle of between about 110° and 120°.

4,677,962

GEARLIKE TOOL FOR DRESSING ABRASIVE, GEARLIKE, PRECISION MACHINING TOOLS

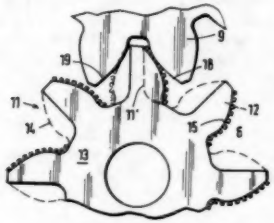
Herbert Loos, Dorfen-Stadt, and Manfred Erhardt, Puchheim, both of Fed. Rep. of Germany, assignors to Carl Hurth Machinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 664,811, Oct. 25, 1984. This application Apr. 17, 1986, Ser. No. 853,088

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346189

Int. Cl.[4] B24B *53/06*

U.S. Cl. 125—11 CD **8 Claims**



1. In a dressing tool for dressing of abrasive gearlike precision tools, comprising a metallic, gearlike constructed base member, the tooth flanks of which are coated with extremely hard grinding grains and in which the gap between two successive teeth is wider than in a comparable gear with otherwise the same tooth system data, the improvement comprising wherein on the metallic base member from at least each second tooth, from a defined location on said metallic base member, is removed at least one of the normal left and right tooth flanks.

4,677,963

ANNULAR CUTTING DISC

Hrant K. Ajamian, 30087 Cartier Dr., Rancho Palos Verdes, Calif. 90274

Filed Nov. 14, 1984, Ser. No. 671,175

Int. Cl.[4] B28D *1/04*

U.S. Cl. 125—15 **11 Claims**

1. An improved anular cutting disc comprising, in combination:

a metallic annular core member having:

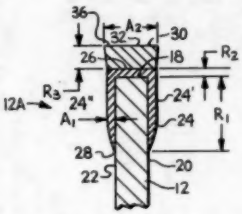
(A) a central axis;

(B) an outer wall defining a predetermined outer perimeter;

(C) an inner wall defining a predetermined inner perimeter;

(D) a pair of opposed surfaces extending between said core member in regions adjacent said cutting portion thereof, and extending radially outwardly from said inner wall a first preselected distance toward said outer wall, and having an inner first coating edge spaced from said central axis, and said first coating having a first preselected axial thickness on each of said pair of opposed surfaces of said core member to define outer surfaces of said first coating;

a second coating on said inner first coating edge and extending radially inwardly toward said central axis a third preselected distance to define a cutting edge, and said second coating having a second preselected axial thickness and having a pair of oposed radially extending surfaces between said inner first coating edge and said cutting edge, said second preselected axial thickness of said second coating is greater at said cutting edge than at said inner first coating edge;



said first coating is, substantially free of diamond particles;

said second coating is a slurry of diamond particles in a matrix; and

said pair of opposed radially extending surfaces of said second coating are substantially free of loosely held diamond particles.

4,677,964

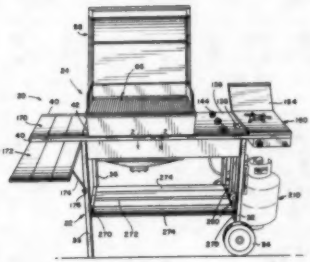
PORTABLE GAS GRILL

Charles W. Lohmeyer, Barrington; Erich J. Schlosser, Lindenhurst; James E. Tucker, Batavia; James C. Stephen, Arlington Heights; Andrzej Leja, Palatine, and John Beecher, III, Carpentersville, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Jul. 26, 1985, Ser. No. 759,531

Int. Cl.[4] F24C *3/04*

U.S. Cl. 126—41 R **30 Claims**



1. A gas grill comprising a rectangular housing having upper and lower edges and a pair of corner support members at opposed corners with abutments on upper surfaces between said upper and lower edges and openings in an opposed end wall aligned with said corner support members, at least two elongated burner units of substantially identical construction, each burner unit consisting of an elongated tube having at least one row of apertures along a peripheral edge and a flattened portion on one end located in a common plane with said row of apertures, said flattened portion having a slot extending from a free edge with said slot being offset from the center axis

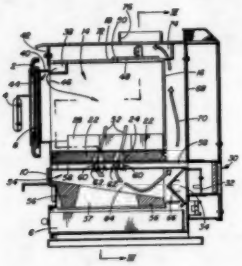
of said elongated tube and receiving an abutment so that said tubes can be inserted axially through said openings and be supported on said corner support members and said opposed wall end with said apertures directed towards the center of said housing.

4,677,965

WOOD OR COAL BURNING HEATER

Johann G. Duerichen, P.O. Box 3637, Smithers British Columbia, Canada V0J 2N0

Filed Jul. 28, 1986, Ser. No. 889,912
Int. Cl.[4] F24B *5/00*
U.S. Cl. 126—76 **8 Claims**



1. A wood and coal burning heater comprising a housing having a front surface, a rear surface, a bottom surface and a side surface and a top surface having a chimney opening,

and a normally closed primary combustion chamber for the combustion of wood and coal within the housing, the combustion chamber having a top wall and a rear wall spaced inwardly from the top and rear surfaces of the housing forming therebetween horizontal and vertical smoke passages respectively,

and a door opening in the front surface for access to the primary combustion chamber and a door for tightly closing the door opening,

and a secondary combustion chamber positioned below the primary combustion chamber for the burning of combustible smoke, gas and ash passing downwardly from the primary combustion chamber, the secondary combustion chamber being lined along its bottom and sides with insulating refractory material and having a narrow opening in the bottom for the downward discharge of ashes into an air-tight ash drawer,

the primary and secondary combustion chambers being separated by a grate of high-temperature ceramic refractory material which is provided with two narrow spaced slots which are aligned in front of rear direction,

and an elongate air supply tube positioned immediately below and in parallel alignment with the slots in the grate with the air supply tube having air supply orifices positioned beneath the slots for the discharge of air for secondary combustion,

and means for independently introducing air for combustion into the primary and secondary combustion chambers, the air for combustion in the primary combustion chamber being introduced upwardly in the primary combustion chamber and the air for combustion in the secondary combustion chamber being introduced through the air supply tube,

whereby smoke and gas produced by combustion in the primary combustion chamber pass downwardly through the slots in the grate into the lined secondary combustion chamber and then rearwardly therein and then upwardly in the vertical smoke passage to the horizontal smoke passage for discharge through the chimney opening.

4,677,966

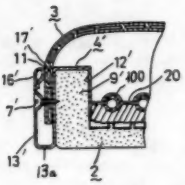
SOLAR HEAT COLLECTOR ASSEMBLY

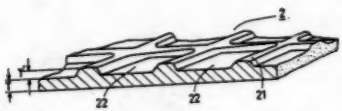
Nobushige Arai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 687,270, Dec. 28, 1984, abandoned, which is a division of Ser. No. 637,690, Aug. 6, 1984, Pat. No. 4,526,162, which is a continuation of Ser. No. 485,286, Apr. 15, 1983, abandoned. This application Mar. 5, 1986, Ser. No. 837,653

Claims priority, application Japan, Oct. 29, 1982, 57-164793[U]

Int. Cl.[4] F24J *3/00*
U.S. Cl. 126—450 **1 Claim**





1. A solar heat collector assembly comprising:

a heat collector means,

a top cover means for the heat collector means containing a plurality of air cavities for increasing the heat insulating efficiency of said assembly, and

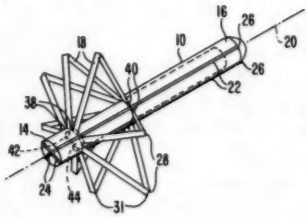
a base means for accommodating said heat collector means made of a foamed resinous heat insulating material, said top cover means joining with said base means to house said heat collector means, said base means including a latticed rib configuration portion extending therefrom comprising a multiplicity of ribs defining a plurality of rectangularly shaped concavities therebetween, said ribs having a trapezoidal configuration which enhance the stability of said heat collector assembly.

4,677,967

INTRAVAGINAL ANCHOR

David L. Zartman, Worthington, Ohio, assignor to New Mexico State University Foundation, Las Cruces, N. Mex.

Filed Nov. 1, 1984, Ser. No. 667,370
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 R **23 Claims**



1. An intravaginal anchoring device for a mammalian female comprising

(a) an elongated tubular body provided with a plurality of slots disposed substantially parallel to each other and to the length of said body such that, in an expanded position,

the ends of said body are moved towards each other and flange portions of said body between adjacent pairs of said slots are distended away from an axis of said body and, in a collapsed position, the ends of said body are moved away from each other and flange portions are retracted towards said axis and

(b) a biasing means for urging said body into said expanded position,

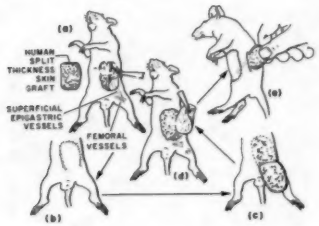
wherein, in said expanded position, the greatest distance between distal vertices of opposing flange portions is less than an expanded internal diameter of an anterior portion of said female's vagina but greater than a contracted internal diameter of a posterior portion of said vagina prior to the onset of fetal delivery so that the device is free and mobile therein.

4,677,968

METHODS OF TESTING THE REACTION OF VARIOUS SUBSTANCES ON LIVING HUMAN SKIN

Gerald G. Krueger, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah

Filed Jan. 14, 1986, Ser. No. 818,871
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 R **36 Claims**



1. A method for testing the effects of substances on human skin comprising the steps of:

(a) providing an isolated skin flap having a layer of living human skin and a layer of living animal skin, said flap being served by an isolated vasculature attached to a test animal and sandwiched between the layers of skin such that substantially all blood leaving the flap flows through the isolated vasculature;

(b) placing a quantity of the substance to be tested in contact with the human skin portion of the skin flap;

(c) removing at least one sample of blood from the isolated vasculature as the blood leaves the skin flap;

(d) analyzing the contents of the blood removed.

4,677,969

CERVICAL COLLAR PERMITTING TRACHEOTOMY

Anthony Calabrese, Philadelphia, Pa., assignor to Charles Griener and Company, Inc., Westville, N.J.

Continuation of Ser. No. 656,123, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 520,083, Aug. 4, 1983, Pat. No. 4,515,153. This application Nov. 1, 1985, Ser. No. 794,258
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—75 **6 Claims**

1. A cervical collar suitable for use with a stabilizer having a connecting member with a tongue resiliently connected thereto and a hole for receipt of a rivet, said collar comprising:

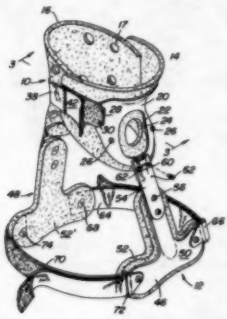
first and second discrete collar halves, one of said collar halves being a front half and the other being a rear half, each collar half being U-shaped and having a bight portion and side portions and being formed of a soft flexible light-weight polymeric plastic material;

a first rigid support means secured to and located adjacent a bight portion of the front collar half;

a second rigid support means secured to and located adjacent the bight portion of the rear collar half;

means for removably interconnecting the free ends of the collar halves in overlapping relation; and

each of said first and second rigid support means including a lower portion adapted to releasably secure the stabilizer thereto, each lower portion includes an alignment means



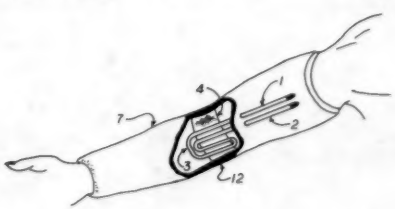
and a fastening means, said alignment means includes a tab which is an extension of said lower portion, said tab having a width less than said lower portion, said tab having a slot extending into said tab, said slot adapted to receive the tongue on said stabilizer, and said fastening means includes an opening through said tab and spaced from said slot and adapted to receive the rivet whereby when the tongue engages said slot, the opening and hole are coaxially aligned.

4,677,970

ORTHOPEDIC HEAT TRANSFER SYSTEM FOR ORTHOPEDIC CASTS

Carlos J. Greer, Rte. 5, Box 161B, Covington, La. 70433; John L. Hirsius, 4620 Richland, and Marshall K. Book, 3939 Houma Blvd., both of Metairie, La. 70002

Filed Aug. 9, 1985, Ser. No. 764,833
Int. Cl.[4] A61M *1/00*
U.S. Cl. 128—82.1 **14 Claims**



1. An orthopedic cast system using a liquid for the transfer of heat to or from a trauma location existing on an individual, comprising:

continuous, closed, tubular pathway means for circulation of a liquid medium into and out of a cast without fluid loss;

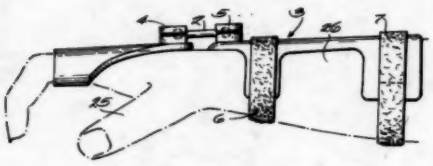
restraining means associated with said tubular means for holding said tubular means in a fixed configuration at a fixed location;

an inlet port allowing the liquid medium into said tubular means;

an outlet port allowing the removal of the liquid from said tubular means; and

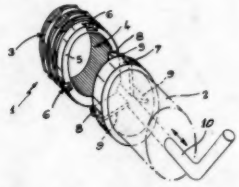
cast means surrounding and integrally incorporating said pathway means and said restraining means into the cast.

4,677,971
ADJUSTABLE WRIST SPLINT
Peer Lindemann, West Bend, Wis., assignor to Rolyan Manufacturing Co. Inc, Menomonee Falls, Wis.
Filed Dec. 26, 1985, Ser. No. 813,539
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 R **20 Claims**



1. An adjustable wrist splint including a selectively positioned and supported handpiece in a selected one of a plurality of positions on a forearmpiece comprising:
a cushioned forearmpiece;
a cushioned handpiece;
a single link pivotally connected to said forearmpiece and to said handpiece and supporting said handpiece to selectively allow universal pivotal movement between said pieces;
said handpiece including means for embracing a hand;
said forearmpiece including means for embracing a forearm;
said link including at least one universal pivotal and lockable joint to selectively allow universal pitoval movement between said forearmpiece and said handpiece; and
readily adjustable tightening means in said universal pivotal joint to selectively lock said joint and prevent pivotal movement of said joint and fixedly support said handpiece on said forearmpiece.

4,677,972
COUPLING ASSEMBLY FOR JOINING AN IMPLANT TOOL TO A BONE IMPLANT
Alain Tornier, Le Brocey, 38130 Crolles, France
Filed Feb. 5, 1986, Ser. No. 826,450
Claims priority, application France, Feb. 7, 1985, 85 01915
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 V **3 Claims**

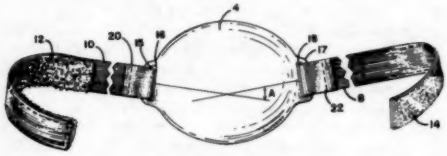


1. A coupling assembly for securing a bone implant such as an artificial acetabulum to a tool for use in implanting the implant comprising the bone implant having an annular flange mounted thereto, said annular flange having a front face, a plurality of notches formed in spaced relationship with respect to one another in said front face of said annular flange, each of said notches having at least one undercut wall portion, the tool having a forward annular end portion having a plurality of wedge shaped teeth extending outwardly therefrom in generally parallel relationship to the axis of the tool, each of said wedge shaped teeth of the tool being of a size to be cooperatively received within said notches in said annular flange so as to create a space adjacent thereto in each notch, a plurality of shim means slideably carried by the tool adjacent each of said wedge shaped teeth so as to be axially movable with respect thereto, and means for simultaneously moving said shim means so as to enter said spaces within said notches to thereby bind each of said wedge shaped teeth within said notches and thereby lock the tool to the bone implant.

4,677,973
PROXIMAL, TIBIAL OSTEOTOMY FOR LEVELING A TIBIAL PLATEAU
Barclay Slocum, 241 Sly Glass Dr., Eugene, Oreg. 97401
Filed May 28, 1985, Ser. No. 737,737
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VW **2 Claims**

1. A method of performing a proximal tibial osteotomy comprising
producing a curvilinear cut adjacent the proximal metaphysis of the tibia, the lower part of which cut is concave as viewed from such metaphysis, such cut being made generally perpendicular to the sagittal plane, to free a caudal, tibial portion within the metaphyseal region of the tibia for movement relative to the remaining portion of the tibia that includes the diaphysis of the tibia and the tibial crest,
rotating the two thus-cut-separated tibial portions to produce a new angular relationship therebetween in such plane without effecting translation of the thus-cut-separated tibial portions relative to one another, and
fixing the two thus-rotated portions to anchor them in such new angular relationship.

4,677,974
METHOD AND APPARATUS FOR IMMOBILIZING AN EYELID
David Leonardi, 2320 Plaza del Grande, Las Vegas, Nev. 89102
Filed Sep. 30, 1985, Ser. No. 781,457
Int. Cl.[4] A61F *13/12*
U.S. Cl. 128—163 **8 Claims**



1. An eyelid splint adapted to immobilize an eyelid of only

one eye of a patient consisting essentially of a flexible, resilient pad member adapted to press against the exterior of a patient's eyelid, said pad having a thickness of at least 14 mm, a backing member for mounting a pad thereon, and means for maintaining a pressure of 23–40 mm Hg on the eyelid, said means consisting essentially of an elastic strap means attached to the backing member for encircling the head of a patient, the strap means comprising first and second elastic strap members each having an end portion, and first and second interengaging fastening members comprising a plurality of mating hooks and loops mounted on the end portions of said straps for fastening said straps at adjustable lengths.

4,677,975

METHOD OF DISPENSING AND/OR A DISPENSER

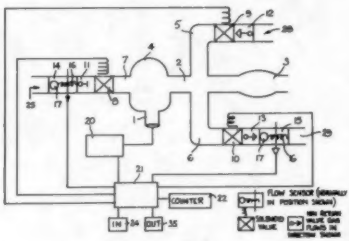
Brian W. Edgar, and Robert B. Elliott, both of Auckland, New Zealand (4), assignors to The University of Auckland, Auckland, New Zealand

Filed Oct. 16, 1985, Ser. No. 788,030

Claims priority, application New Zealand, Oct. 16, 1984, 209900

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—200.14 **16 Claims**



1. A dispenser, comprising:

a supply means to supply inhalable material in inhalable form;

a mouthpiece;

said supply means being in communication with the atmosphere and said mouth piece;

a flow control means to selectively allow or substantially prevent flow between said supply means and said mouth piece and between said supply means and the atmosphere;

a signalling means to indicate to the user when to inhale and subsequently when to exhale;

a first detection means to detect the commencement of inhalation and to cause a first timer to time a predetermined inhalation period, said first detection means also causing said flow control means to permit said inhalable material to move from said supply means to said mouth piece during a predetermined part of said period of inhalation, and to substantially prevent further inhalation at the end of said inhalation period; and

a second detection means to detect the commencement of exhalation subsequent to the end of the period of inhalation and to cause a second timer to time a predetermined exhalation period.

4,677,976

EMERGENCY MASK

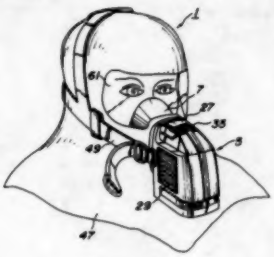
Katsumi Fujinuma, 2-105; 1100-4, Ohaza-Iwatsuki, Iwatsuki City, Saitama Pref.; Tsuneyoshi Takase, and Yoriyuki Hayashi, both of Shimonoseki, all of Japan, assignors to Toyo Cei Kabushiki Kaisha, Tokyo and Katsumi Fujinuma, Iwatsuki, both of, Japan

Filed Mar. 27, 1984, Ser. No. 594,973

Claims priority, application Japan, Apr. 1, 1983, 58-46746[U]

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—201.25 **10 Claims**



1. An emergency mask comprising: a hood covering at least the face of a user and having an air passage hole; a face piece attached to the inside of the hood so as to engage the nose and mouth of the user and having a tubular coupling end; a canister containing air-purifying antidote therein and having two opposed ends, with an intake hole being disposed at one end and a discharge hole being disposed at the other end, an inlet check valve; and an outlet check valve; characterized in that the mask further comprises: a substantially cylindrical sealing member made of soft non-flammable flexible material and having one end thereof airtightly secured to the periphery of the air passage hole of said hood; a canister-holder having a tubular coupling end thereof airtightly coupled with said tubular coupling end of the face piece, with said sealing member being interposed between said tubular coupling end of said canister-holder and said tubular coupling end of said face piece so as to create an airtight seal between said hood, said face piece and said canister-holder; said canister-holder having an inside chamber defined therein which chamber communicates with said face piece through said coupling end thereof and has an inlet opening and an outlet opening; and a connecting means for airtightly connecting said canister to said canister-holder in a detachable manner with the discharge hole of the canister facing the inlet opening of the canister-holder, the connecting means having a loop rib projecting toward said canister around the inlet opening of the canister-holder, and a clamp means pivotally secured to said canister-holder so as to selectively engage and urge the canister toward said loop rib for causing airtight coupling between the other end of the canister and the canister-holder around said inlet opening; the inlet check valve being interposed between the intake hole of the canister and the inside chamber of the canister-holder for permitting air flow through the inlet opening of the inside chamber only in the direction from the canister toward the inside chamber; and the outlet check valve being mounted on said outlet opening of said canister-holder so as to allow air outflow through said outlet opening only away from the inside chamber and exclusively to the atmosphere.

4,677,977

MASK FOR PRESSURE BREATHING

Orland W. Wilcox, Pasadena, Calif., assignor to Gentex Corporation, Carbondale, Pa.

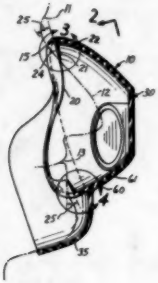
Filed Aug. 3, 1984, Ser. No. 637,398

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—206.24 **9 Claims**

1. A face mask for pressure breathing comprising: a body

having a sealing boundary shaped to fit over the bridge of the wearer's nose, downward past both sides of his nose and mouth, and across his mental protuberance, so as to make a fluid sealing contact along said boundary, said sealing boundary including a reflective primary seal, a secondary seal substantially non-deflectible with respect to said primary seal, and a canopy extending from said boundary to overlay the region included by said boundary, said canopy including means adapted to be connected to a breathing hose, said primary seal extending entirely around said sealing boundary and comprising a readily flexible flange having a base edge and a free edge, and between them and facing away from the canopy, a sealing



surface, said sealing suface being so shaped and arranged as to form an acute angle with the face around substantially all of its length, before substantial deflection, and to lay against the wearer's face when the mask is pressed sufficiently against the wearer's face, said secondary seal extending entirely around said sealing boundary and being more rigid than said primary seal, said secondary seal extending along said boundary on the other side of said sealing boundary from said free edge and so disposed and arranged as to not substantially indent the skin when the primary seal first touches the face, but to be drawn against and indented into the skin when pressed sufficiently tightly against the face by force exerted toward the face mask in alignment with said secondary seal;

4,677,978

EMERGENCY CRICOTHYROTOMY SYSTEM AND CRICOTHYROTOMY KIT

Richard J. Melker, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 414,680, Sep. 3, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 655,317

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.14 **1 Claim**

1. A method for performing emergency cricothyrotomy ventilation permitting spontaneous inspiration and complete exhalation between inspirations comprising the steps:

palpatating the cricothyroid membrane between the thyroid and cricoid cartilages;

making an incision in the membrane between the thyroid and cricoid cartilages;

placing an over-the-needle catheter over a hollow needle;

inserting an over-the-needle catheter and needle into the airway between the thyroid and cricoid cartilages through the incision with an attached syringe remaining outside of the airway;

determining that the needle is in the airway by applying gentle back pressure on the syringe;

removing the needle and syringe;

feeding a guide-wire through the over-the-needle catheter into the airway;

removing the over-the-needle catheter;

dilating the cricothyroid membrane to receive an air passage catheter having an internal diameter of about 5.5 mm thereby permitting spontaneous inspiration and complete exhalation between inspirations;

introducing an air passage catheter having an internal diameter of about 5.5 mm along the guide-wire into the airway;

removing the guide-wire and securing the air passage catheter in the airway.

4,677,979

LANCET

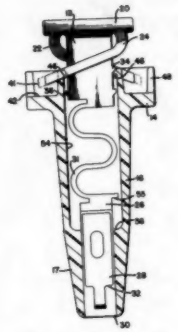
James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 11, 1985, Ser. No. 743,231

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] A61B *17/34*

U.S. Cl. 128—314 **10 Claims**



1. A lancet assembly comprising,

(a) an elongated housing;

(b) a passage extending through said housing with a lance opening at one end thereof;

(c) an elongated lancet body reciprocable in said passage;

(d) a lance blade positioned in said lancet body at one end thereof;

(e) handle means on said lancet body at the end thereof opposite said lance blade; the improvement characterized by

(f) a plurality of spaced apart first integral abutment means on said housing and extending into said passage;

(g) a plurality of spaced apart second integral abutment means on said lancet body for cooperating with said first abutment means;

(h) first integral resilient means on said handle means and extending between said handle means and said housing;

(i) second resilient means in said lancet body;

(j) whereby pushing said handle means causes said body to move through said passage in a first direction making one of said second abutment means to move past on of said first abutment means causing a snap-action in a puncture direction and in turn causing said lancet blade to move through said lance opening;

(k) said pushing first movement compressing said first and second resilient means and damping said snap-action;

(l) said pushing first movement stopped by engagement of one of said second abutment means with one of said first abutment means; and

(m) release of said handle means causing relaxation of said first and second resilient means and movement of said lancet body in said passage in a non-puncture direction until engagement of the other one of said second abutment means with the other one of said first abutment means for maintaining said lance blade within said housing in a non-contaminating position.

4,677,980

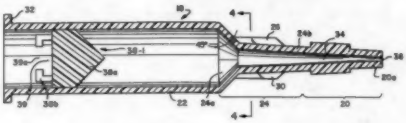
ANGIOGRAPHIC INJECTOR AND ANGIOGRAPHIC SYRINGE FOR USE THEREWITH

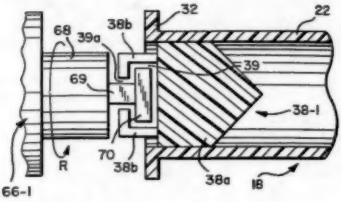
David M. Reilly, Glenshaw, and Arthur E. Uber, III, Pittsburgh, both of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 617,807, Jun. 6, 1984, abandoned. This application Oct. 1, 1985, Ser. No. 782,586

Int. Cl.[4] A61M *5/20*; A61B *6/00*

U.S. Cl. 128—655 **65 Claims**





1. An angiographic injector for injecting a contrast media from an angiographic syringe which includes a movable plunger for forcing contrast media from said syringe into the vascular system of an animal, said injector comprising:

mounting means for supporting at least one syringe for an injection operation;

actuating means adjacent said mounting means for controlling the movement of said plunger in said syringe;

drive means disposed at one end of said actuating means for causing retraction of said plunger in said syringe and advancement of said plunger in said syringe to force the contrast media from said syringe in the injection operation; and

quick release means forming respective mating parts of said plunger and said drive means for selectively placing said plunger in a driven state by said drive means such that said drive means can retract said plunger in said syringe, and in an undriven state by said drive means such that said drive means can be retracted relative to said plunger without retraction of said plunger, the mating parts of said quick release means cooperating so that said plunger can be placed in its driven state or in its undriven state at any time during the injection operation and at any position of the plunger, without substantial force being applied therebetween.

4,677,981

DEVICE FOR THE EXAMINATION OF OBJECTS BY ULTRASONIC ECHOGRAPHY WITH ANGULAR FOCUSING

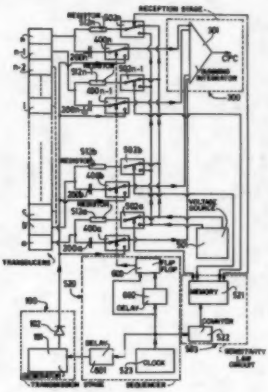
Roger H. Coursant, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1985, Ser. No. 778,634

Claims priority, application France, Sep. 25, 1984, 84 14682

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 **1 Claim**



1. A device for the examination of objects by ultrasonic echography comprising a focusing network of n ultrasonic transducers associated with a transmission stage for the repeated transmission of ultrasonic waves across the region to be explored and with a reception stage for the processing of the return echoes received, wherein:

said ultrasonic transducers are made of an electrostrictive material with non-remanent polarisation and further comprising

(1) a source of p polarisation direct voltages,

(2) demultiplexing and branching circuit means which include n demultiplexers each of which receives the p polarisation direct voltages selects one of the said voltages and supplies, via a series polarisation resistor the selected voltage to one of said ultrasonic transducers;

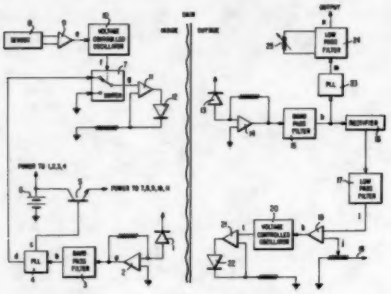
(3) a circuit means which determines a law of sensitivity corresponding to two phase states and to p/2 or (p+1)/2 amplitude states when p is even or odd, respectively, said circuit means comprising a counter having a number of states which correspond at least to the number of different directions in which it is desired to perform an examination by focusing the ultrasonic waves, and a memory which supplies to the n demultiplexers, in response to any particular state of the counter, n respective digital combinations corresponding to the said state thereby indicating to each demultiplexer one of the direct voltages which it has to select for the polarisation of the transducer associated with it;

(4) sequencer means comprising a clock circuit which fixes the duration of the transmission and reception periods and the rate of change of state of the counter.

4,677,982
INFRARED TRANSCUTANEOUS COMMUNICATOR AND METHOD OF USING SAME

Llinas, Rodolfo R.; Mutsuyuki Sugimori, and Ronald K. Crank, all of New York, N.Y., assignors to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 336,337, Dec. 31, 1981, abandoned. This application Mar. 29, 1984, Ser. No. 594,990
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—664 **7 Claims**



1. A method for bidirectionally transmitting information between an infrared transmitter implanted in the interior of a living organism, and an external apparatus controlled by an operator, comprising:

transmitting an infrared light signal at a desired adjustable frequency within a given frequency range from said external apparatus to an infrared light detector implanted in the interior of said organism;

detecting the frequency of the infrared signal received by the implanted infrared light detector;

in response to detection of a frequency of the received said infrared signal which is within said given frequency range, converting the detected received frequency within said given frequency range to a voltage signal whose amplitude is proportional to the received frequency;

measuring a physiological variable of the organism, by means of a sensor implanted in the interior of said organism, and providing a signal whose frequency is proportional to the measured physiological variable;

frequency modulating said voltage signal with said signal whose frequency is proportional to the measured physiological variable;

feeding said frequency modulated signal to said transmitter to cause same to transmit a frequency modulated infrared signal to said external apparatus;

receiving said frequency modulated infrared signal in said external apparatus; and

detecting the frequency of the received frequency modulated signal as a measure of the physiological variable measured by the sensor.

4,677,983
METHOD AND APPARATUS FOR MEASURING CIRCULATORY FUNCTION

Keiji Yamaguchi, Shimizu, and Hideo Ishizaka, Hatano, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Mar. 11, 1986, Ser. No. 838,604
Claims priority, application Japan, Mar. 11, 1985, 60-46379
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—680 **24 Claims**

1. A circulatory function measurement apparatus comprising:

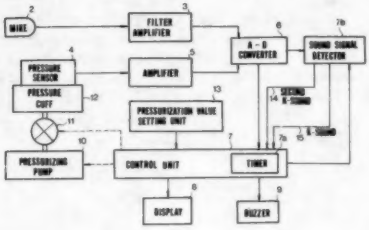
pressure control means for controlling pressure applied to a blood vessel of a living body;

sound detecting means for detecting a sound from the blood vessel produced due to a change in a value of the pressure applied to the blood vessel by said pressure control means;

first recognition means for recognizing whether the sound from the blood vessel detected by said sound detecting means agrees with a first specific condition and for generating first recognition information indicating agreement with the first specific condition;

second recognition means for recognizing whether a sound from the blood vessel detected by said sound detecting means agrees witha second specific condition less stringent than the first specific condition and for generating second recognition information indicating agreement with the second specific condition; and

measuring means for measuring first and second parameters of circulatory function based on the first and second recognition information from said first and second recognition means, said measuring means selectively measuring the first parameter of circulatory function based upon the first recognition information from said first recognition means when there is a reduction in the pressure applied to the blood vessel by said pressure control means, said measuring, means selectively measuring the second parameter of circulator function based upon the second recognition information from said second recognition means when said first recognition means recognizes that the sound from the blood vessel agrees with the first specific condition, this latter measurement being made for a predetermined period of time after such recognition, and said measuring means again selectively measuring the first parameter of circulatory function based upon the first recognition information from said first recognition means after the predetermined period of time.



4,677,984
CALIBRATED ARTERIAL PRESSURE MEASUREMENT DEVICE

Bohumir Sramek, Irvine, Calif., assignor to Bomed Medical Manufacturing, Ltd., Irvine, Calif.

Filed Sep. 24, 1984, Ser. No. 653,460
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—681 **21 Claims**

1. An apparatus for measuring arterial blood pressure and recreating the arterial blood pressure waveform throughout the cardiac cycle of a patient, comprising:

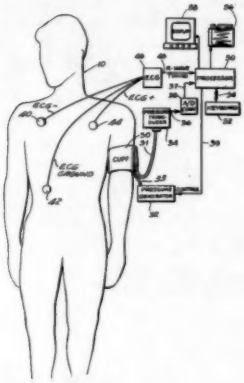
an inflatable cuff;

a source of selectively variable pneumatic pressure connected to said cuff to inflate and deflate said cuff;

a pressure transducer connected such that it detects the magnitude of the pneumatic pressure applied to said cuff and provides a transducer output signal responsive to said magnitude, said transducer output signal including transitions corresponding to increases in the detected pressure magnitude at the beginning of arterial blood flow beneath said inflatable cuff during a cardiac cycle and transitions corresponding to decreases in the detected pressure at the end of arterial blood flow beneath said inflatable cuff during a cardiac cycle;

an electrocardiographic means for sensing the electrical signals of the patient's heart and for providing an R-wave output signal responsive to the R-wave in said electrical signals; and

a control means electrically connected to receive said transducer output signal and said R-wave output signal, which control means processes said output signals to calculate the elapsed times from the occurrence of the R-wave in a cardiac cycle to said transitions in said transducer output



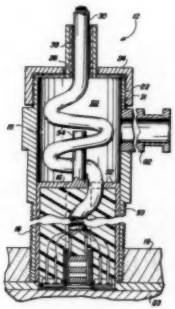
signal and to accumulate data corresponding to said calculated elapsed times and the magnitude of said pneumatic pressure for each cardiac cycle, and to provide output information corresponding to the magnitude of the blood pressure of the patient with respect to time within the cardiac cycle, said control means further providing control signals to said source of variable pneumatic pressure to control the rates of increase and decrease of said pneumatic pressure.

4,677,985

APPARATUS AND METHOD FOR DETERMINING INTRACRANIAL PRESSURE AND LOCAL CEREBRAL BLOOD FLOW

William J. Bro, 3735 W. Cavalier Dr., Phoenix, Ariz. 85019, and L. Philip Carter, 2910 N. 3rd Ave., Phoenix, Ariz. 85013

Filed Aug. 12, 1985, Ser. No. 764,496
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—691 **11 Claims**



1. An intracranial probe for measuring local cerebral blood flow and intracranial pressure comprising:

(a) a casing defining a generally cylindrical bore, said casing having an exterior portion for securement to the skull of a body and further including a pressure port communicating with said bore and adapted to communicate pressure to a remote pressure monitor;

(b) a piston reciprocal in said bore;

(c) a first platinum-containing contact plate forming at least a portion of said piston;

(d) a second platinum-containing contact plate forming at last a portion of said piston;

(e) first signal means coupled to said first contact plate for outputting a signal proportional to the temperature of the first plate;

(f) second signal means coupled to said second contact plate for outputting a signal proportional to the temperature of said second plate, said first and second means adapted to be connected to comparative means;

(g) first conductor means connected to said first plate;

(h) second conductor means connected to said second plate, said first and second conductor means adapted to be connected to polygraph means to monitor current generated by said plates; and

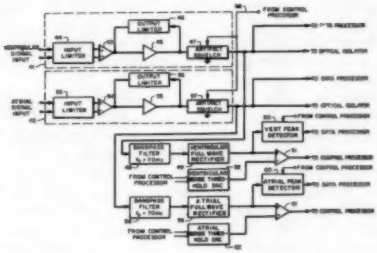
(i) means for polarizing said contact plates whereby said probe is securable in said skull with the said portions of the piston adapted to be in contact with the dura for measuring local cerebral blood flow by both thermal and hydrogen clearance techniques and means associated with said piston communicating a pressure signal indicative of intracranial pressure whereby the internal pressure is communicated across said piston to said bore to said pressure port.

4,677,986

UNSATURABLE SENSE AMPLIFIER FOR PACER SYSTEM ANALYZER

Robert DeCote, Jr., Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 28, 1985, Ser. No. 738,608
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—697 **10 Claims**



1. An unsaturable sense amplifier for use in a pacer system analyzer to sense and amplify intracardiac signals induced in response to pacing pulses being applied to the heart of a patient, comprising:

first amplifier means for amplifying an applied voltage and being subject to saturation by said applied voltage exceeding a first predetermined saturating level;

second amplifier means coupled to the output of said first amplifier means for amplifying said output of said first amplifier means and being subject to saturation by said output exceeding a second predetermined saturating level;

input limiting means coupled to the input of said first amplifier means for limiting said applied voltage to less than said first predetermined saturating level;

output limiting means connected between the input and output of said second amplifier means for limiting said input of said second amplifier means to less than said second predetermined saturating level; and

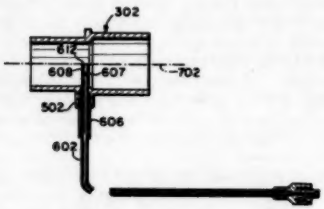
artifact squelch means coupled to said output of said second amplifier means for squelching said output when said output exceeds a predetermined squelch level.

4,677,987

GAS SAMPLING APPARATUS FOR CAPNOGRAPHY

Pradip V. Choksi, Northridge, Calif., assignor to SpaceLabs Inc., Redmond, Wash.

Filed Apr. 16, 1986, Ser. No. 852,859
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—719 3 Claims



1. An apparatus for obtaining a sample gas flow from a patient's exhaled gas stream present in an air tube coupled to said patient comprising:

a connector adapted for insertion in said air tube, said connector providing a pathway for said gas flow, said connector including:

an elongated main tubular portion along whose axis said gas flow pathway is generally parallel; and

a hollow cylinder coupled to a side wall of said main tubular portion and protruding outwardly therefrom, the interior of said cylinder communicating with the ambient atmosphere through a distal open end and with the interior of said main tubular portion through an aperture in the wall of said main tubular portion, said hollow cylinder having an internal diameter substantially larger than the diameter of the aperture in said tubular portion wall;

a hollow sampling line detachably coupled to said connector comprising:

a sampling end portion with a first open end and at least one hole spaced apart from said open end through the wall of said sampling end portion; and

a reinforced portion for reinforcing said sampling line, said reinforced portion spaced apart from said sampling line open end and said at least one hole, said reinforced portion having an outer diameter substantially larger than the diameter of said sampling end portion, said sampling end portion comprising the length of said sampling line from the first open end to the start of said reinforced portion, said reinforced portion adapted to frictionally engage the interior of said hollow cylinder when said sampling line is coupled to said connector, the length of said sampling end portion being long enough such that said first open end and said at least one hole extend through said aperture in the wall of said main tubular portion into the patient's exhaled gas stream.

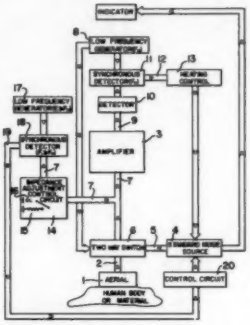
4,677,988

METHOD AND APPARATUS FOR MEASURING MICROWAVE NOISE

Eugéne Constant; Yves Leroy, both of Villeneuve d'Ascq, and Jean-Claude Van De Velde, Mons-en-Baroeul, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Mar. 21, 1985, Ser. No. 714,700
Claims priority, application France, Mar. 21, 1984, 84 04792
Int. Cl.[4] A61B 5/05; A61N 5/02
U.S. Cl. 128—736 10 Claims

1. A device for measuring thermal microwave radiation of an object for measuring the internal physical temperature of the object including a human or animal body comprising, an antenna to pickup thermal microwave electromagnetic radiation of the object and convert it into a received signal proportional to the temperature of the object, an integrated circuit comrpising a temperature reference source of known temperature made as a planar resistor for developing a temperature reference signal proportional to the temperature of the temperature reference source, an amplifier in said integrated circuit and switch means for alternatively applying said received signal and said temperature reference signal to said amplifier to develop an output therefrom corresponding to an error signal representative of a difference between the temperature of said object and the temperature of said temperature reference source, detector means receiving outputs of the amplifier for detecting said error signal, a low frequency generator in the



integrated circuit for applying a low frequency signal to said switch means for alternately connecting to said amplifier the antenna and said temperature reference source to continuously apply the signal outputs therefrom to said amplifier to compare the physical temperatures of said body and said temperature reference source, heat control means in said integrated circuit comprising heatable resistors for controlling the application of heat to said planar resistor of said temperature reference source for varying the physical temperature thereof, sychronizing means receptive of the error signal from the detector means for synchronizing application of the error signal from the detector to said heat control means and which is directly proportional to the temperature difference between said body and the temperature reference source thereby to obtain a nil error signal so that the temperature of the temperature reference source will thereby correspond to the temperature of said object.

4,677,989

IRIDIUM OXIDE COATED ELECTRODES FOR NEURAL STIMULATION

Lois S. Robblee, Randolph, Mass., assignor to EIC Laboratories, Inc., Norwood, Mass.

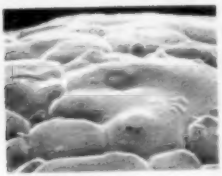
Filed Feb. 6, 1986, Ser. No. 829,693
Int. Cl.[4] A61N 1/05
U.S. Cl. 128—784 6 Claims

1. A metallic electrode for injecting charge into biological tissue with controlled electrical pulses comprising,

a metallic electrode that is made of a metal that is predominantly different from iridium having a metallic surface,

said metallic surface being coated with an irdinium oxide coating sufficiently thick to significantly reduce corrosion

and significantly increase charge capacity while being sufficiently thin to allow charge to flow between said



metallic surface and biological tissue separated from said metallic surface by said iridium oxide coating.

4,677,990

ENDOCARDIAL ELECTRODE CONTROLLABLE TO FORM SELECTED CONTOURS

Heinz Neubauer, Jaerfaella, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 25, 1986, Ser. No. 832,677

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1985, 3507119

Int. Cl.[4] A61N *1/05*

U.S. Cl. 128—786 **8 Claims**

1. An endocardial electrode controllable to form selected contours comprising:

a flexible electrical conductor having an internal axial channel and covered with an insulating sheath, said conductor having a distal end and a proximal end;

at least one electrode head attached at said distal end of said conductor for contact with heart tissue; and

at least one traction element extending through and freely movable in said channel and attached to said conductor at a selected location and having at least one portion thereof eccentrically guided outside and parallel to said conductor within said insulating sheath for a predetermined distance, said traction element projecting from said channel at said proximal end thereof;

whereby tension exerted on said traction element at said proximal end deforms said conductor in a region substantially co-extensive with said portion of said traction element to a selected contour dependent upon the amount of tension.

4,677,991

GRAIN DEFLECTOR FOR COMBINES

James R. Harris, and Leland H. Harris, both of R.R. 1, Miami, Mo. 65344

Filed Jan. 31, 1986, Ser. No. 824,435

Int. Cl.[4] A01F *12/44*

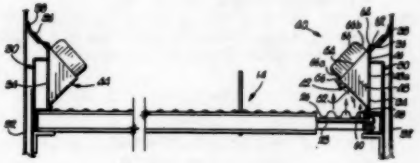
U.S. Cl. 130—27 AE **39 Claims**

24. An attachment for the foraminous, reciprocable grain cleaning platform of a crop harvesting machine for increasing the cleaning efficiency of the platform during operation of the machine on side hill slopes, said platform having a pair of upstanding sidewalls extending along opposite side margins of the platform in the direction of reciprocation thereof, said attachment comprising:

a pair of separate, elongated deflector members each having a longitudinally extending base adapted for disposition alongside of one of said sidewalls inboard of the latter when the attachment is secured to the platform,

each of said members further having an inclined baffle surface extending along the length thereof and projecting from said base at an oblique angle relative to the plane of the latter; and

means for securing said members to opposite sidewalls of the



platform in such a manner that said baffle surfaces of the members project angularly inwardly and upwardly toward one another above lateral side margins of the platform in order to redirect air and crop materials back toward the central portion of the platform when the machine is harvesting on a side hill slope,

said securing means serving to fix said baffle surfaces relative to said platform.

4,677,992

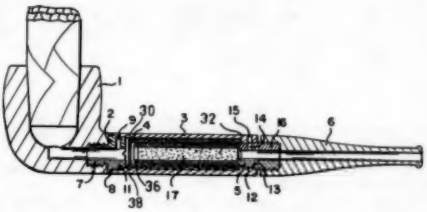
SMOKING APPARATUS HAVING CONVOLUTED FILTERING/HEAT-REDUCTION PASSAGEWAY

Bedrich V. Bliznak, 362 Rindge Ave., Apt. 3B, Cambridge, Mass. 02140

Filed Feb. 10, 1986, Ser. No. 828,028

Int. Cl.[4] A24D *3/04*

U.S. Cl. 131—209 **13 Claims**



1. A smoking apparatus having a long convoluted passageway thhrough which smoke must travel for filtering and heat reduction, wherein the smoking apparatus comprises:

an elongated separable tubular casing;

removably attached to one end of the tubular casing, a means for receiving and holding a burning tobacco product;

removably attached at an opposite end of the casing, a mouthpiece for drawing smoke from the burning tobacco product into a user's mouth;

intermediate of the two ends a convoluted passageway through which smoke from the burning tobacco product passes en route to the user's mouth, wherein the passageway comprises at least one elongated member having a series of disconformities along its surface, which disconformaties create a passageway through which the smoke passes in a substantially spiraling pattern;

wherein the convoluted passage comprises within the casing a first cylinder slightly smaller in diameter than the casing, wherein the cylinder along its length on an exterior surface comprises a spiral ridge protruding from the outer cylinder into contact with the casing to form a spiral passageway therebetween;

wherein the first cylinder is hollow and sealed on the end

which adjoins the means for receiving and holding the burning tobacco product and the convoluted passageway further comprises a second cylinder slightly smaller in diameter than the first cylinder and fitting within the first cylinder with a small space therebetween, wherein the second cylinder along its length on an exterior surface comprises a spiral ridge protruding from the second cylinder into contact with the first cylinder thereby forming a spiral passageway therebetween;

wherein the second cylinder is hollow and the convoluted passageway further comprises a filter made of an absorbant material which is snugly inserted into the second cylinder.

4,677,993

METHOD OF AND APPARATUS FOR INSPECTING CIGARETTE PAPER

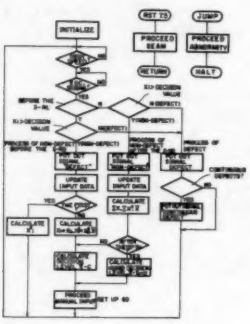
Yukio Kato; Mikio Komori, and Tadao Yonai, all of Tokyo, Japan, assignors to Japan Tobacco Inc., Japan

Filed Jan. 25, 1984, Ser. No. 573,809

Claims priority, application Japan, Feb. 1, 1983, 58-13712

Int. Cl.[4] A24C *5/00, 5/14*

U.S. Cl. 131—280 **11 Claims**



1. A method of inspecting cigarette paper of eventual cigarette bar comprising the steps of

(a) detecting a pressure varying with air leakage through cigarette paper of an eventual cigarette bar;

(b) converting said detected pressure into a corresponding electric signal;

(c) transforming said electric signal into digital data;

(d) storing said digital data;

(e) calculating mean, variance and standard deviation from said stored digital data for each eventual cigarette bar;

(f) obtaining a decision level by substracting a product of a predetermined constant and standard deviation from said mean; and

(g) making a decision as to pass the inspected eventual cigarette bar when said data thereof is higher than said decision level and as to reject the cigarette bar when said data thereof is lower than the decision level.

4,677,994

PROCESS FOR TREATING, DRYING AND EXPANDING TOBACCO

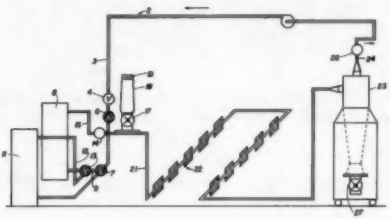
Robert F. Denier, Louisville, Ky.; Robert H. Marshall, New Albany, Ind.; John N. Jewell, Macon, Ga., and Elmer F. Litzinger, Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 24, 1986, Ser. No. 832,554

Int. Cl.[4] A24B *15/20, 15/28*

U.S. Cl. 131—310 **23 Claims**

1. A process of forming favorable flavor compounds in a moisturized tobacco comprising: introducing pressurized superheated steam into a restricted pressure and flow controllable system; controlling the pressure differential and velocity flow of said superheated steam across said system so that said steam is at a preselected velocity to entrain and a preselected minimum pressure to improve the favorable flavor compounds and fill value of tobacco to be introduced into said system; applying an ammonia source to the tobacco treated in said



system; introducing the tobacco through a first gas lock into said system to be entrained by said pressurized steam for a preselected residence time in said system; disentraining the ammonia-treated tobacco from said pressurized steam at the end of said residence time; and discharging the disentrained ammonia-treated tobacco from said system through a second gas lock into a zone of lower pressure.

4,677,995

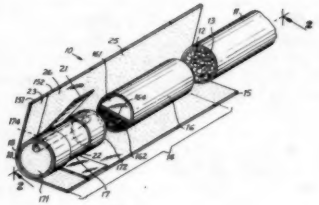
FILTER CIGARETTE

Andrew G. Kallianos, Midlothian; Francis M. Sprinkel, Jr., Glen Allen, and Paula Decker, Petersburg, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 24, 1986, Ser. No. 831,837

Int. Cl.[4] A24D *3/04, 3/06, 3/18*

U.S. Cl. 131—335 **12 Claims**



1. A filter cigarette, comprising:

a substantially cylindrical tobacco rod;

a substantially cylindrical filter assembly; and

tipping paper circumscribing and joining said filter assembly and said tobacco rod; wherein:

said filter assembly comprises:

a first filter assembly segment having a mouth end, a rod end, and a plurality of smoke flow paths therethrough separated by at least substantially smoke-impervious barrier means, at least one of said smoke flow paths containing a smoke flavoring medium;

means abutting said first filter assembly segment and rotatable relative thereto for selectively directing smoke through at least one of said smoke flow paths, and excluding it from the remainder of said smoke flow paths; and

means for sealing at least one of said smoke flow paths when smoke is not being directed therethrough, thereby preventing escape of said smoke flavoring medium.

4,677,996

SMOKING ARTICLE MOUTHPIECES

John A. Luke, Eastleigh, United Kingdom, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jun. 20, 1985, Ser. No. 746,803
Claims priority, application United Kingdom, Jun. 22, 1984, 8415973
Int. Cl.[4] A24D 3/02, 3/04
U.S. Cl. 131—336 7 Claims

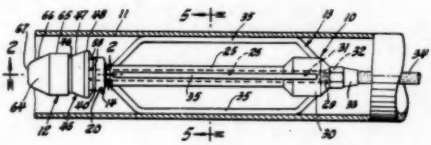
1. A method for making a mouthpiece element, comprising the steps of: forming a cylindrical mouthpiece element; forming at least one duct means extending from one end to the other end of said cylindrical mouthpiece element and open throughout its length; forming ventilation air access means composing the step of moving said cylindrical mouthpiece element and a heated groove former relatively of each other, such that the heated groove formed is caused to penetrate the mouthpiece element to a depth sufficient to pass through said duct means thereby thermally severing the duct means forming a groove in the mouthpiece element open to the peripheral surface of the mouthpiece element and thermally sealing the groove walls of the mouthpiece element making said walls gas impervious.

4,677,997

HIGH PRESSURE REVOLVING SEWER CLEANING NOZZLE

John W. Strauss, 6366 Winter Dr., Canton, Mich. 48187

Filed Dec. 2, 1985, Ser. No. 803,566
Int. Cl.[4] B08B 9/04
U.S. Cl. 134—167 C 5 Claims



1. A sewer pipe cleaning apparatus, for cleaning the interior of a sewer pipe, including a skid means carrying a pipe shaft which has one end constructed for connection to a source of high pressure fluid and the other end connected a sewer cleaning nozzle, characterized in that said nozzle comprises:

(a) a non-rotating base member having a longitudinal axis, and having one end fixedly connected to said other end of the pipe shaft;

(b) a rotatable turbine member rotatably mounted on the base member about the longitudinal axis of the base member, and having a front end and a rear end, and having a plurality of jet orifices formed on the rear end thereof, and each of said jet orifices is inclined toward the rear end of the turbine member, at an acute angle relative to the longitudinal axis of the base member;

(c) a bearing means mounted on the base member and in an operative abutting engagement with one end of said turbine member;

(d) a non-rotating nose cone mounted on said base member for retaining said bearing means and rotatable turbine member on the base member;

(e) said base member and turbine member having fluid passages formed therethrough, for the transmission of high pressure fluid from said pipe shaft and through said passages and out said jet orifices, for cleaning discharge against the inner surface of a sewer pipe and for rotating the turbine member and moving the cleaning apparatus through the sewer pipe; and,

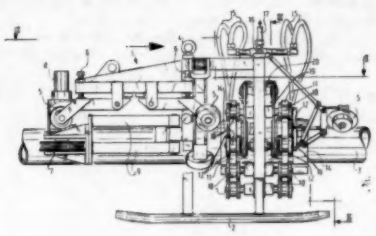
(f) retainer means for releasably securing said nose cone on said base member.

4,677,998

METHOD AND APPARATUS FOR REMOVING PIPE COATINGS

Dirk F. van Voskuilen, and Frans van Voskuilen, both of No. 12, Stationsweg, 3931 ES Woudenberg, Netherlands

Division of Ser. No. 529,752, Sep. 6, 1983, Pat. No. 4,552,594. This application Aug. 16, 1985, Ser. No. 766,419
Claims priority, application Netherlands, Sep. 8, 1982, 8203501
Int. Cl.[4] B08B 3/02
U.S. Cl. 134—181 8 Claims



1. Apparatus for removing bituminous or other coatings from a pipe surface having a circumferential and longitudinal direction, essentially comprising:

a frame adapted for being mounted around the pipe to be treated;

adjacent nozzles on said frame direction against the pipe surface;

means for feeding pressurized water to said nozzles,

said nozzles being directed against the pipe surface at an acute impact angle relative to said circumferential direction of the pipe;

means for moving each of said nozzles in a zigzag path having the longitudinal direction of the pipe as its main direction, there being an acute angle between each pair of adjacent portions of said zigzag path; and

the path of adjacent nozzles being closely spaced in said circumferential direction.

4,677,999

CANOPY

Stuart R. Cannon, St. Andrews; William J. Brazenor, North Melbourne; Peter W. Kneen, Arncliffe, and John L. Mullen, Kew, all of Australia, assignors to S. & M. Cannon Pty. Ltd., Melbourne, Australia

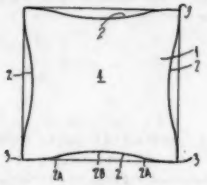
PCT No. PCT/AU82/00186, § 371 Date Jul. 13, 1982, § 102(e) Date Jul. 13, 1982
PCT Filed Nov. 12, 1982, Ser. No. 517,518
Int. Cl.[4] E04H 15/58, 15/64; E04B 1/12; A47H 23/00
U.S. Cl. 135—117 13 Claims

11. A canopy panel comprising:

a stretch fabric panel member; and

means for tensioning said panel extending inwardly along edges of said panel member between adjacent corners in a

bell shaped configuration which is concave in a center portion and convex in areas adjoining said corners, rela-



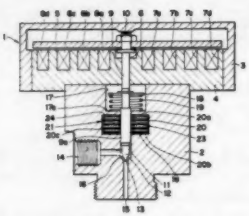
tive to said edge, wherein said means for tensioning is an inelastic tendon fastened to said panel member.

4,678,000

HIGH SPEED ELECTROMAGNETIC VALVE

Takeo Kushida, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1986, Ser. No. 815,998
Claims priority, application Japan, Jan. 18, 1985, 60-7191
Int. Cl.[4] F16K *31/06*
U.S. Cl. 137—1 **2 Claims**



1. A method of driving a high speed electromagnetic valve having a housing, a stator fixed to said housing comprising excitation coil means, an armature slidably mounted to said housing for moving toward and away from said stator and subject to an excitation force exerted by said stator when current is supplied to said excitation coil means, a valve rod fixed to said armature and slidable therewith, a spring means connected between said housing and said armature for exerting a displacement force on said armature acting in a first direction opposite to a second direction in which said excitation force acts and a piezoelectric means mounted to said housing around said valve rod, said method comprising:

initially applying voltage to said piezoelectric means mounted to said housing around said valve rod thereby causing said piezoelectric means to contract to exert pressure on said valve rod such that said valve rod and said armature fixed thereto are held by said piezoelectric means and cannot slide relative to said housing and said stator;

while applying said voltage to said piezoelectric means, exciting said excitation coils thereby exerting said excitation force on said armature held by said piezoelectric means; and

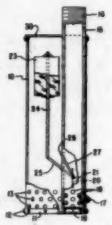
after exciting said excitation coils, interrupting said application of voltage to said piezoelectric means thereby causing said contracted piezoelectric means to expand to release said valve rod whereby said armature and said valve rod slide in said first direction under the influence of said excitation force exerted on said armature by said stator against said displacement force exerted on said armature by said spring.

4,678,001

PUMP PRIME MAINTAINER

James J. Lacey, c/o Ed Lacey, P.O. Box 829, Trent, S. Dak. 57065

Continuation-in-part of Ser. No. 711,747, Mar. 14, 1985, abandoned. This application Feb. 10, 1986, Ser. No. 828,136
Int. Cl.[4] F16K *31/18*
U.S. Cl. 137—194 **4 Claims**



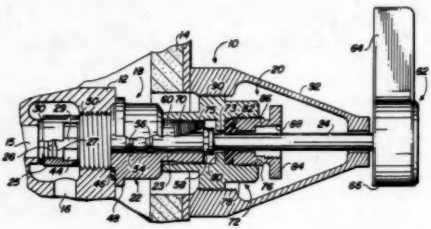
1. A device to control the flow of liquid being exhausted from a sump or the like comprising a substantially circular cylindrical casing formed to provide openings through which said liquid can enter said casing, a pipe extending into said casing, a butterfly valve in said pipe, said valve having a pivoting plate loosely fitting in said pipe, said valve having an open position and a closed position and being movably adjustable between the two positions, float means operably connected to said valve and adapted to move said valve between said open and closed positions, said float means including a float vertically slidable within said casing.

4,678,002

FAUCET VALVE WITH ADJUSTABLE STEM TIGHTENER

Harold J. Valley, 23462 Coso, Mission Viejo, Calif. 92692

Filed May 10, 1985, Ser. No. 732,611
Int. Cl.[4] F16K *43/00, 5/08, 41/00*
U.S. Cl. 137—315 **4 Claims**



1. A ceramic disc faucet valve with stem tightening means which allows said faucet valve to be mounted in a horizontal attitude with a control lever having a laterally extending handle portion mounted thereon, said faucet valve with stem tightening means comprising in combination:

(a) a faucet valve including,

I. a valve body for mounting on a vertical surface and defining a water flow path therethrough,

II. a valve stem mounted in said valve body and having an elongated portion of uninterrupted cylindrical configuration extending axially therefrom, said valve stem being rotatable about a horizontal axis,

III. a matching pair of ceramic discs mounted in contiguous engagement with each other within the flow path of said valve body, a first one of said pair of discs being held against rotation in said valve body and a second

one of said pair of discs being coupled for rotation with said valve stem about the horizontal axis, each of said pair of discs having at least one aperture formed therethrough so that reciprocal rotation of said second one of said discs through approximately 90 degrees will align and misalign the apertures of said pair of discs for opening and closing of the flow path through said valve body;

(b) a valve stem tightening means on said valve body and extending axially therefrom in circumscribing relationship with said valve stem, said valve stem tightening means being in frictional engagement with the periphery of the cylindrical extending portion of said valve stem to prevent unwanted rotational movement thereof; said valve stem tightening means includes means surrounding at leas a portion of said valve stem which is adjustable for varying the amount of friction applied radially and inwardly thereby on said valve stem, a cover means surrounding said tightening means and said adjustable means to prevent any tampering thereto; and

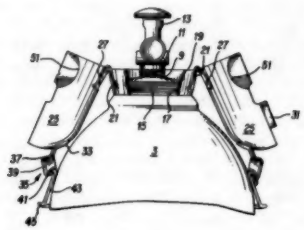
(c) a control lever mounted on the extending end of said valve stem for manual manipulation thereof, said control lever including a lever body which is mounted on the extending end of said valve stem and an elongated handle portion extending laterally from said lever body.

4,678,003

SAFETY CAP FOR VALVE ON HIGH-PRESSURE CYLINDER

Beacher C. Griffin, Rte. 1, Box 292, Pamplico, S.C. 29583

Filed Oct. 10, 1986, Ser. No. 917,548
Int. Cl.[4] F16K *27/12*
U.S. Cl. 137—382 **6 Claims**



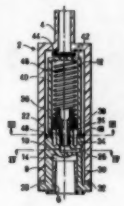
1. A safety cap for use with a high-pressure gas cylinder having a shut-off valve, said shut-off valve having radial and longitudinal axes, said safety cap having a closed position to protect said shut-off valve against damage and tampering, said safety cap having an open position to provide unrestricted access to said valve; said safety cap comprising a base bracket. hinge means, shield halves, clamping means; said gas cylinder and base bracket having cooperating means mounting said base bracket in removable fixed relationship on said cylinder and without interfering with said shut-off valve, said base bracket carrying said hinge means, said shield halves having lateral axes, said hinge means pivotally mounting said shield halves to turn about their said lateral axes, said shield halves being pivotable in one direction toward each other for abutting relationship of said shield halves and defining the closed position of said safety cap with said shield halves protecting said valve against damage and tampering, said shield halves being pivotable in the opposite direction away from each other and defining the open position of said safety cap providing such unrestricted access radially and longitudinally to said valve, and said shield halves carrying said clamping means for clamping together said shield halves and maintaining said shield halves in their abutting relationship in the closed position of said safety cap.

4,678,004

QUICK-ACTION ON/OFF VALVE

Peretz Rosenberg, Moshav Beit Shearim, Israel

Filed Jun. 20, 1985, Ser. No. 746,863
Claims priority, application Israel, Jul. 6, 1984, 72316
Int. Cl.[4] F16K *17/30*
U.S. Cl. 137—469 **14 Claims**



1. An on/off valve for controlling the flow of a fluid between an inlet line and an outlet line to which said valve is to be connected, comprising:

a housing including a partition dividing its interior into a first chamber, a second chamber, and an interconnecting passageway;

a first port connectable to one of said lines and communicating with said first chamber;

a second port connectable to the other of said lines and communicating with said second chamber;

a piston fixed in said first chamber;

a cylinder disposed in said first chamber and movable with respect to said piston fixed in said first chamber;

said cylinder including a closed end facing said first port and of substantially larger cross-sectional area than said first port;

the space between said piston and cylinder being vented to the atmosphere;

a resilient disc interposed between said first port and said closed end of the cylinder;

the opposite end of the cylinder being opened and facing said partition;

spacing means cooperable with said partition and said open end of the cylinder for continuously maintaining communication between said first chamber and said interconnecting passageway;

and a spring interposed between said fixed piston and said movable cylinder urging the cylinder in the direction tending to close said first port.

4,678,005

FLOW REGULATOR

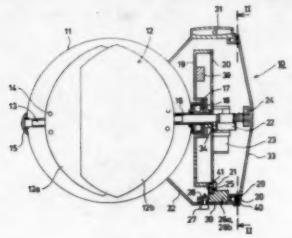
Erkki Aalto, and Veikko Ylä-Hemmilä, both of Kausala, Finland, assignors to Halton Oy, Finland

Filed Jan. 7, 1985, Ser. No. 695,363
Claims priority, application Finland, May 20, 1983, 831799
Int. Cl.[4] F16K *31/12, 17/00*
U.S. Cl. 137—499 **22 Claims**

1. A flow regulator for gaseous substance, particularly for air in air-conditioning and ventilation installations, for maintaining the volumetric flow rate of the gaseous substance at desired magnitude with sufficient accuracy when differential pressure acting across the flow regulator varies within given limits, said flow regulator comprising

an envelope and a regulating member turnably disposed in a flow passage confined by the envelope, said member disposed to turn with increasing differential pressure progressively crosswise with reference to the direction of flow and assume an equilibrium position in response to a torque produced by the gaseous substance on the flow regulating member and a countertorque dependent on the position of the regulating member, such that the requisite

pressure drop for maintaining the volumetric flow at pre-selected magnitude is achieved, characterized in that there is at least one position in the operating range of turning



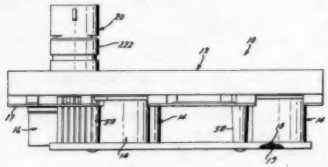
of the flow regulator, wherein at least a part of a flow surface of the regulating member is left in a shadow of the flow surface thereof as viewed in the direction of flow of the gaseous substance.

4,678,006

ELECTRICALLY OPERATED AUTOMATIC TRANSMISSION CONTROLLER ASSEMBLY

Bradley L. Northman, Southfield; Michael Slavin, Troy, and Donald J. West, Warren, all of Mich., assignors to Lectron Products, Inc., Rochester Hills, Mich.

Filed Mar. 24, 1986, Ser. No. 843,164
Int. Cl.[4] F15B *13/06*
U.S. Cl. 137—596.17 **37 Claims**



1. A transmission controller assembly adapted for use with a transmission having a portion thereof formed with a mounting surface and fluid ducts of predetermined configuration opening through said mounting surface, said assembly comprising:

a manifold having fluid flow ports and adapted to be detachable fastened to said transmission with a first side thereof on said mounting surface;

solenoid operated valve means having inlet and outlet ports at one end and electrical terminals at the other end thereof said solenoid operated valve means adapted to control the flow of fluid in said fluid ducts in response to electrical signals applied to said electrical terminals;

mounting means supporting said solenoid operated valve means on said manifold and positioning said valve means with said inlet and outlet ports exposed to said fluid flow ports of said manifold and in communication with said fluid ducts;

holding means fastening said solenoid operated valve means to said manifold; and

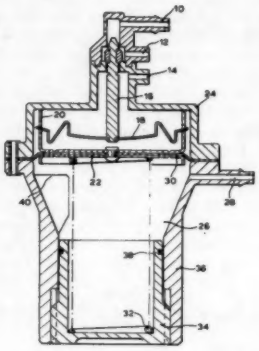
a circuit board surmouting said manifold, said circuit board having a first surface facing away from said manifold and soldering pads on said first surface, said solenoid electrical terminals extending through said board and positioned adjacent said soldering pads.

4,678,007

PRESSURE OPERATED VALVE

Keith C. Ransom, Benfleet, and Henry G. Howitt, Malmesbury, both of United Kingdom, assignors to Ford Motor Company, Dearborn, Mich.; Mycalex (Motors) Ltd., Gloucestershire, England

Filed Dec. 5, 1985, Ser. No. 805,493
Claims priority, application United Kingdom, Dec. 5, 1984, 8430681
Int. Cl.[4] F16K *31/126*
U.S. Cl. 137—625.66 **8 Claims**



1. A two position, three port control valve assembly, comprising, a valve housing having a central port and an end port axially spaced therefrom on each side of the central port, a valve reciprocably mounted in the housing movable between two end positions alternately connecting the central port to one or the other of the end ports, an annular flexible diaphragm movable independent of the valve and dividing the housing into a valve chamber side and a pressure chamber side, a control pressure port opening into the housing and operatively connected to the pressure chamber and connected to a source of pressure for moving the diaphragm, and overcenter snap action type spring means operatively connecting the diaphragm to the valve for a limited movement therebetween for control movement of the valve between its end positions upon actuation of the diaphragm and for providing a snap action overcenter movement of the valve during diaphragm movement to rapidly move the valve between its end positions, the connecting means including a spacer axially spacing the spring means from the diaphragm which interconnects the two, the spacer being a cup-shaped element with a base and an upstanding annular wall portion, and the spring means being of the plate type edge mounted to the wall portion.

4,678,008

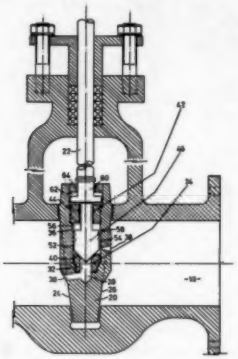
WEDGE TYPE GATE VALVES

Leslie L. Gyongyossy, 245 N. Point St., Apt. 306, San Francisco,, Calif. 94133

Filed Sep. 8, 1986, Ser. No. 904,365
Int. Cl.[4] F16K *3/12*
U.S. Cl. 137—630.12 **4 Claims**

1. In a gate valve having a valve stem mounted in a wedge-shaped valve member for limited relative movement between an extended position and a contracted position, said wedge-shaped valve member having a pressure equalizing passage opening therethrough which communicates between the upstream and downstream sides thereof, a pressure equalizing valve located in a chamber formed in said valve member which is arranged to communicate with said through passage, said pressure equalizing valve being movable toward and away from a valve seat located in said pressure equalizing passage to close and open the pressure equalizing passage, said chamber being proportioned to provide an expansion compartment on

the side of the pressure equalizing valve remote from the valve seat to accommodate movement of the pressure equalizing valve from the closed position to the opened position, said pressure equalizing valve being freely movable within said chamber when said valve stem is in said extended position relative to said valve member, the improvement of;



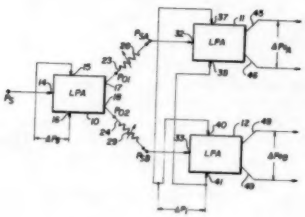
a vent passage opening from said expansion compartment of said chamber through the downstream side of the valve member such that any pressure buildup in the expansion compartment resulting from the opening of the pressure equalizing valve may be vented to the downstream side of the valve member and will not cause the pressure equalizing valve to move to its closed position.

4,678,009

FLUIDIC COMPLEMENTARY GAIN CHANGING CIRCUIT

George Mon, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1986, Ser. No. 917,446
Int. Cl.[4] F15C *1/12, 1/08*
U.S. Cl. 137—818 **5 Claims**



1. A laminar flow fluidic complementary gain changing circuit comprising:

A first laminar proportional amplifier having a supply stream input port connected to a fluid pressure supply, a first control stream input port, a second control stream input port, a first output port and a second output port;

bias means connected to the first and second control stream input ports of said first laminar proportional amplifier for supplying a differential pressure signal therebetween;

a second laminar proportional amplifier having a supply stream input port, a first control stream input port, a second control stream input port, a first output port and a second output port;

first channel means for connecting the first output port of said first laminar proportional amplifier to the supply stream input of said second laminar proportional amplifier;

a third laminar proportional amplifier having a supply stream input port, a first control stream input port, a second control stream input port, a first output port and a second output port;

second channel means for connecting the second output port of said first laminar proportional amplifier to the supply stream input of said third laminar proportional amplifier;

third channel means for connecting the first control stream input port of said second laminar proportional amplifier with said first control stream input port of said third laminar proportional amplifier;

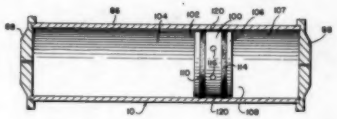
fourth channel means for connecting the second control steam input port of said second laminar proportional amplifier with said second control stream input port of said third laminar proportional amplifier, whereby said third and fourth channel means receive differential input pressure signals therebetween so that a first differential output signal is produced between the first and second output ports of said second laminar proportional amplifier and a second differential output signal is produced between the first and second output ports of said third laminar proportional amplifier, the magnitude of the first and second differential output signals being complementary to one another with pressure gains a function of the differential pressure signal supplied to the first and second control stream input ports of said first laminar proportional amplifier.

4,678,010

ACCUMULATOR FOR AIRLESS SPRAYING APPARATUS

Gene Purvis, 7704 Grensted, Lawton, Okla. 73505; Russell Phelps, 106 N. 6th St.; Tim Dupler, 2100 S. 4th St., both of Lawton, Okla. 73501; Patrick Landoll, Elgin, and Leonard Landoll, Lawton, both of Okla., assignors to Gene Purvis; Russell Phelps and Tim Dupler, all of Lawton, Okla.

Filed Feb. 22, 1985, Ser. No. 704,521
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—31 **4 Claims**



1. An accumulator for an airless spraying apparatus, the accumulator comprising:

(a) a pressure vessel,

(b) a single piston slideably disposed in said pressure vessel,

(c) an expansible chamber partially defined by one side of said piston, which expansible chamber is for receiving, storing and discharging pressurized liquid,

(d) an energy storing section on the other side of said piston for storing energy from the expansion of the expansible chamber due to the introduction of a pressurized liquid into the expansible chamber and for releasing that energy when liquid is discharged from the expansible chamber and the chamber contracts,

(e) said piston including a first seal adjacent said one side of said piston and a second seal adjacent said other side of said piston, said first and second seals defining a lubricating space therebetween, said one side and said other side of said piston being rigidly and integrally joined to one another for movement together as a unit,

(f) said piston including a plurality of inwardly extending passages therein, said passages opening into said lubricating space,

(g) said passages containing a supply of lubricant therein, which lubricant is permitted to flow into said lubricating space to lubricate said first and second seals, whereby said lubricating passages provide for a long term self-contained supply of lubricant,

(h) said lubricating space being sealed and isolated from said expansible chamber and from said energy storing section so that there is no communication between said lubricating space, on the one hand, and said expansible chamber and energy storing section on the other hand, whereby said expansible chamber and said energy storing section are kept substantially free of lubricant,

(i) said inwardly extending passages being elongated and extending radially inwardly to provide a spoke-like pattern of lubricating passages in said piston,

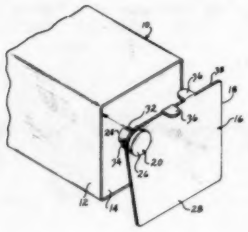
(j) each said inwardly extending passage being in the form of a blind hole which ends in the interior of said piston such that, except where each said inwardly extending passage opens into said lubricating space, which lubricating space surrounds said piston, each said inwardly extending passage is isolated from every other inwardly extending passage within said piston, whereby each said inwardly extending passage provides a separate reservoir of lubricant.

4,678,011

END CAP FOR A TUBULAR MEMBER

Charles A. Weber, Goshen, Ind., assignor to Bock Products, Elkhart, Ind.

Filed Jan. 7, 1985, Ser. No. 816,885
Int. Cl.[4] B65D *59/00*
U.S. Cl. 138—96 R **8 Claims**



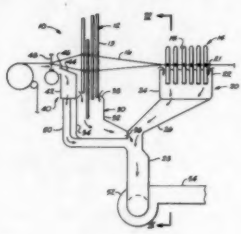
1. In combination, a tubular member having a side wall defining an open end, an end cap carried by said tubular member and removably overlying said tubular member open end, said cap comprising a plate part and an attachment part pivotally carried by said plate part, said attachment part secured to said tubular member side wall and constituting means for permitting said plate part to be pivoted relative to the attachment part between a closed position overlying said tubular member open end and an open position exposing said tubular member open end, said attachment part including a shank and a head, said plate part having an opening, said attachment part shank extending through said plate part opening with said attachment part head abutting said plate part, said attachment part shank including a terminal end face and having a slot form therein extending longitudinally from said end face towards said attachment part head, said attachment part shank fitted at said slot about said tubular member side wall at its said open end, a securement device carried by said attachment part shank and contacting said tubular member side wall to connect the attachment part shank to said tubular member side wall.

4,678,012

CLEANING AND YARN CONDITIONING SYSTEM FOR WEAVING MACHINES

Walker O. Graham, 105 Sycamore Dr., Mauldin, S.C. 29662, and William T. Pearson, Lakewood Dr., Prosperity, S.C. 29127

Filed Aug. 4, 1986, Ser. No. 892,936
Int. Cl.[4] D03J *1/02*
U.S. Cl. 139—1 C **16 Claims**



1. In a weaving machine having a warp supply, a warp stop motion having drop wires, a harness motion for selectively raising and lowering warp ends passing through the drop wires and harness heddles, a reed mounted on a sley for beating up weft yarn, and a cloth take-up roll, means for conditioning the warp yarns and for cleaning lint, size and fly from selected surfaces of said weaving machine, comprising:

(a) a first vacuum chamber disposed beneath and having walls which partially surround the warp stop motion, having an open top, through which the drop wires extend;

(b) a second vacuum chamber disposed adjacent to the harnesses in a position to receive air passing over the heddles and the warp yarn from the ambient atmosphere of the weave room; and

(c) means for creating a partial low pressure vacuum within said vacuum chambers whereby the ambient atmosphere of the weave room is drawn into said vacuum chambers, across the warp yarn, the drop wires, the heddles, and adjacent surfaces of the weaving machine, to condition the warp yarns and to clean the drop wires, the heddles, and adjacent weaving machine surfaces to remove lint, size and fly developed when the warp yarn passes through said drop wires and said heddles.

4,678,013

WOVEN SLIDE FASTENER

Masaatsu Ofusa, Toyama, and Toshio Ishihama, Osaka, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,774
Claims priority, application Japan, Oct. 12, 1983, 58-157484[U]; Oct. 12, 1983, 58-157485[U]; Oct. 12, 1983, 58-157486[U]
Int. Cl.[4] D03D *1/00*; A44B *19/34*
U.S. Cl. 139—384 B **6 Claims**

1. A woven slide fastener which comprises:

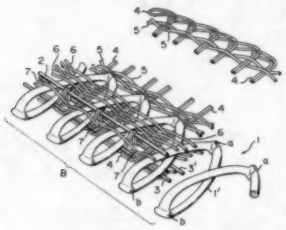
a fastener element row in the form of a flat coil composed of a continuous monofilament having a number of turns, each turn of the flat coil constituting a separate fastener element having a single coupling head, an upper leg and a lower leg, each fastener element including a heel formed by bending the continuous monofilament near a boundary of a neighboring fastener element substantially in a plane containing an axis of the flat coil, the coupling head being formed by bending the continuous monofilament having a single coupling head, an upper leg and a lower leg, each fastener element including a heel formed by bending the continuous monofilament near a boundary of a neighboring fastener element substantially in a plane containing an axis of the flat coil, the coupling head being formed by

bending the continuous monofilament in a plane substantially orthogonal to the axis of the flat coil;

a slide fastener tape including a tape body having a first longitudinal tape edge into which the fastener elements are woven and a second longitudinal tape edge opposite said first longitudinal tape edge;

first warp threads woven into the tape body;

second warp threads woven along said first longitudinal tape edge and extending alternatively about the upper side of the upper legs and the lower side of the lower legs of said elements;



an upper binding warp thread positioned outside of the upper legs and nearer to the coupling heads than said second warp threads and extending along an upper side of an upper leg of said fastener element;

a lower binding warp thread positioned outside of the lower legs and nearer to the coupling heads than said second warp thread and extending along a lower side of a lower leg of said fastener element; and

a weft thread woven into said first and second warp threads so as to cross and interlace with said upper and lower binding warp threads.

4,678,014

INFLATOR/DEFLATOR WITH MOLDED HOUSING

Charles B. Owen, Long Grove; Charles C. Owen, Chicago, both of Ill., and Steve Lin, Taipei, Taiwan, assignors to Siesta Corporation, Northbrook, Ill.

Continuation-in-part of Ser. No. 668,518, Nov. 5, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 845,483

Int. Cl.[4] B65B *3/14*

U.S. Cl. 141—67 **4 Claims**

1. A hand-holdable device for inflating and deflating inflatable articles, comprising:

an electric motor;

impeller means, for propelling air, secured to and rotatably driven by said electirc motor;

a generally rectangular mounting frame secured to said electric motor for effecting mounting thereof, said mounting frame including opposite end frame portions respectively secured to said motor, and a pair of opposed side frame portions extending in parallel relationship to each other between said end frame portions, said mounting frame defining a pair of stop openings respectively positioned at an end of each said side frame portions generally at the junction thereof with one of said end frame portions;

a generally cylindrical, one-piece injection molded plastic housing having an integral, perforate end wall defining a plurality of air inlets, and an open end opposite said perforate end wall, said electric motor, said impeller means, and said mounting frame being positionable within said molded housing so that operation of said electric motor rotates said impeller means to create air flow axially through said housing for effecting inflation of an associated inflatable article, said mounting frame facilitating positioning of said mounting frame, said electric motor, and said impeller means in said molded housing, as an integated pre-assembled unit, by insertion into said housing through said open end thereof;

said molded housing including integrally formed channel means for receiving said mounting frame comprising a pair of opposed channels arranged in parallel relationship to each other on the interior of said molded housing, each said channel being defined by a respective pair of spaced apart, parallel channel projections, said channels being configured to respectively receive said parallel side frame portions of said mounting frame to facilitate mounting of said electric motor and said impeller means within said housing,

said molded housing further including integrally formed stop means on the interior thereof comprising a pair of stop projections respectively positioned at an end of each of said opposed channels, said stop projections being positioned generally adjacent said perforate end wall of said housing, said stop projections respectively engaging said side frame portion of said mounting frame by respective disposition within said stop openings when said mounting frame is inserted through said open end of said housing and received by said channel means for effecting the desired relative axial positioning of said motor and said impeller means within said housing,

locking means positioned within said housing in operative engagement with said mounting frame for locking said mounting frame in position within said opposed channel to maintain said relative axial positioning of said electric motor and said impeller means within said housing;

a perforate end plate secured to said molded housing at said open end thereof, said perforate end plate defining a plurality of air outlets for accommodating said airflow axially through said housing; and

nozzle means adapted to be secured to said housing so that air flowing through said housing flows through said nozzle means, said nozzle means being adapted for detachable connection to said associated inflatable article,

said housing including integrally molded thread means for removably securing said nozzle means on either opposite end of said housing, whereby said nozzle means can be secured to one end of said housing for effecting inflation of said associated inflatable article, and can be secured to the other end of said housing for effecting deflation of said associated inflatable article.

4,678,015

PRODUCT APPORTIONING SYSTEM

Glen F. Raque, and Edward A. Robinson, both of Louisville, Ky., assignors to Raque Food Systems, Inc., Louisville, Ky.

Filed Apr. 3, 1986, Ser. No. 847,487

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—131 **7 Claims**

6. An apportioning apparatus for depositing a selected amount of a particulate material onto a moving receptacle, the apparatus comprising:

a frame;

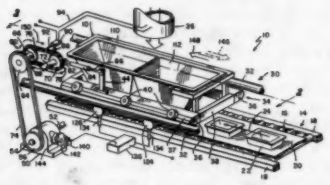
a carriage located above the moving receptacles;

means for mounting the carriage to the frame to allow reciprocating horizontal movement;

at least one bucket mounted in the carriage having an inlet for receiving the particulate material and an outlet for depositing selectively the received particulate material onto the moving receptacles;

two bladed attached to said bucket in opposed relation, said blades being movable between a confronting position where said blades cooperate to seal said bucket outlet and a spaced-apart position where said blades cooperate to open said bucket outlet;

a fluid cylinder attached to each blade for moving each blade between the confronting position and the spaced-apart position;



means for reciprocally driving the carriage between a first position where the bucket receives the particulate material and a second position where the bucket deposits the received particulate material onto the moving receptacle;

first means for controlling the speed of movement of the reciprocating carriage such that the speed and direction of the carriage substantially matches the speed and direction of the moving receptacle near the second position; and

second means for controlling the air cylinders to open the blades for a specified period of time when the carriage is in the second position to deposit the particulate material onto the receptacle.

4,678,016

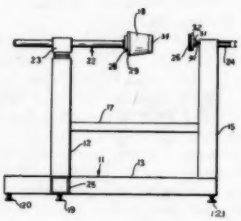
MACHINE AND APPARATUS FOR MAKING BASKETS

Timothy L. Hall, R.D. #10, Box 176, Meadville, Pa. 16335

Filed Sep. 2, 1986, Ser. No. 902,788

Int. Cl.[4] B23J *1/00*

U.S. Cl. 147—48 **5 Claims**



1. A machine for use in making a basket comprising a basket mold and a frame,

a basket mold on said frame,

a support shaft on said frame supporting said basket mold, said basket mold having an end,

clamping means comprising a hydraulic cylinder having a piston and a piston rod,

said piston rod being supported on said frame,

a first flange bearing supported on said piston rod,

a second flange bearing supporting said piston rod,

a pad support on said piston rod,

a foam rubber pad on said pad support,

hydraulic means for moving said piston rod toward said basket mold for urging into position and securing a basket bottom to said basket mold end whereby said basket bottom is supported between said foam rubber pad and said mold.

4,678,017

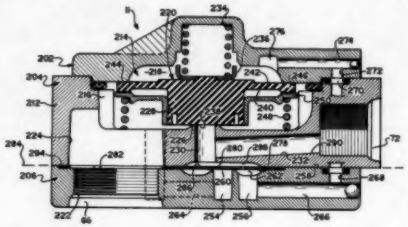
WHEEL END VALVE FOR CENTRAL TIRE INFLATION SYSTEM

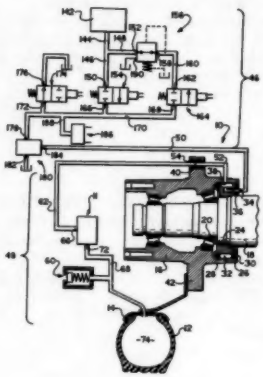
Gary R. Schultz, Portage, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 617,646, Jun. 4, 1984. This application Jul. 1, 1985, Ser. No. 750,363

Int. Cl.[4] B60C *29/00*

U.S. Cl. 152—416 **3 Claims**





1. A modular wheel end valve assembly for a central tire inflation system comprising a valve body having only a first and a second fluid connection from the exterior to the interior thereof, said first fluid connection defined by a first port for connection to a selectively pressurized and exhausted conduit, said second fluid connection defined by a second port for connection to the interior pressurized chamber of an inflatable tire, said valve assembly comprising first valve means responsive to pressurization of said selectively pressurized and exhausted conduit to assume a first position for establishing fluid communication between said first and second ports and responsive to exhausting to atmosphere of said selectively pressurized and exhausted conduit to assume a second position for blocking fluid communication between said first and second ports thereof, said first valve means comprising a first diaphragm having a first surface exposed to fluid pressure at said first port and an opposed second larger surface, said valve assembly comprising second valve means constantly in fluid communication with said second port and responsive to a sensed pressurization of said interior chamber of said tire being less than a predetermined minimum reference pressure to auto-

matically maintain said first valve means in said second position thereof, said assembly characterized by:

said second valve means comprising a second diaphragm having a third suface constantly exposed to fluid pressure at said first port and an opposed fourth surface substantially greater surface constantly exposed to fluid pressure at said second port, said second diaphragm normally biased by fluid pressure in said second port exceeding said minimum reference pressure to block fluid communication between said first port and said second surface and responsive to fluid pressure at said second port not exceeding said minimum reference value to establish fluid/-communication between said first port and said second surface.

4,678,018

SCREEN ARRANGEMENT

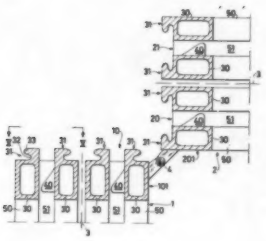
Peter Grundstedt, Sundbyberg, and Bill Taube, Spånga, both of Sweden, assignors to Hennix i Stockholm AB, Sundbyberg, Sweden

Filed Feb. 6, 1986, Ser. No. 826,599

Claims priority, application Sweden, Feb. 15, 1985, 8500730

Int. Cl.[4] A47G *5/00*

U.S. Cl. 160—135 **15 Claims**



14. A foldable screen arrangement, comprising:

first and second, generally planar frames adapted to receive screen panels within said frames, said first and second frames each comprising a plurality of frame members;

means for pivotally connecting said first and second frames so that in an unfolded condition of the screen arrangement, a first frame member of said first frame is generally parallel to and opposes a second frame member of said second frame;

each of said first and second frame members comprising spaced longitudinal section elements which are independently flexible in a direction normal to the plane of the frame, said first and second frame members provided with projections disposed along said longitudinal section elements, in said unfolded condition said projections on said first frame member at least partially overlapping in said normal direction said projections on said second frame member, said projections having a profile such that as said first and second frames are pivoted into the unfolded condition of the screen arrangement, the longitudinal sections are deflected in said normal direction and said projections of the first and second frame members are releasably interconnected;

each first and second frame member provided with means for retaining a panel within the frame during the interconnection and release of said projections.

4,678,019

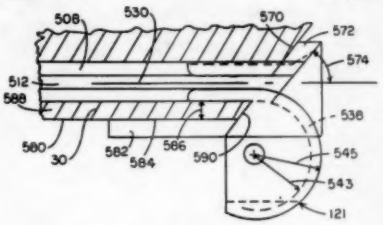
GUIDE ELEMENT ESPECIALLY SUITABLE FOR SOLAR GREENHOUSES AND THE LIKE AND PARTICULARLY UTILIZABLE FOR CONTROLLED SHADING

Chris Esposito, W. Bayshore, N.Y., assignor to Four Season Solar Products Corporation, Holbrook, N.Y.

Division of Ser. No. 591,959, Mar. 21, 1984, Pat. No. 4,598,752, which is a continuation-in-part of Ser. No. 455,475, Jan. 4, 1983, Pat. No. 4,596,093. This application Dec. 2, 1985, Ser. No. 803,550

Int. Cl.[4] A47H *3/00*

U.S. Cl. 160—272 **7 Claims**



1. A guide comprising a body having lateral edges and defining two funnel shaped and generally arcuate guide tracks having generally parallel axes, said tracks being spaced from said edges and in the shape of open troughs, and two parallel tubular extensions on said body defining bores aligned in continuation of said guide tracks, said bores being generally tangentially related to said guide tracks, said tubular extensions being each provided with a lateral slot extending longitudinally therealong, said body being provided with slots extending from said lateral edges and corresponding with the slots in said tubular extensions.

4,678,020

CURING FOUNDRY MOULDS AND CORES

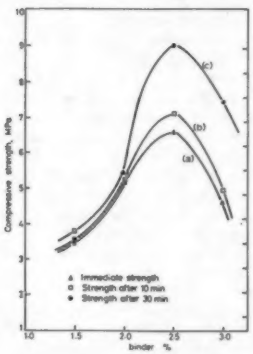
Peter R. Hayes, Redditch, England, assignor to BCIRA, Birmingham, England

Filed Dec. 16, 1985, Ser. No. 809,258

Claims priority, application United Kingdom, Dec. 22, 1984, 8432571

Int. Cl.[4] B22C *9/12*

U.S. Cl. 164—16 **12 Claims**



1. A method of making foundry moulds and cores, said method comprising mixing a granular refractory material with a binder comprising ammonium polyacrylate together with a metal compound which produces a complex ammonium metal polyacrylate to produce a refractory mixture, forming a mould or core from said mixture in a warm box, and passing warm air

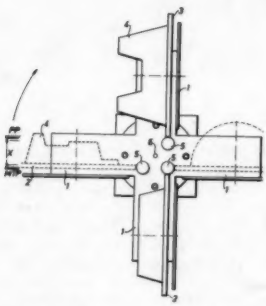
through said mixture to convert said ammonium metal polyacrylate into a waterinsoluble metal polyacrylate with the evolution of ammonia, said binder being present to the extent of up to 5 percent by weight of the weight of said refractory material.

4,678,021

METHOD AND AN APPARATUS FOR REPLACING PATTERN PLATES IN A MOULDING SYSTEM

Vagn Mogensen, Gentofte, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Sep. 10, 1985, Ser. No. 774,410
Claims priority, application Denmark, Sep. 10, 1984, 4315/84
Int. Cl.[4] B22C *15/02, 17/00, 19/00*
U.S. Cl. 164—40 **6 Claims**



1. A method of changing pattern plates in moulding apparatus, said moulding apparatus comprising:

a moulding chamber;

pattern fixtures in said moulding chamber for moulding an article between opposed front faces of said pattern fixtures;

means for releasably securing a pattern plate to respective opposed front faces of said pattern fixtures;

means for conveying pattern plates to said pattern fixtures by a transverse sliding movement between a first position outside said moulding chamber in which first position the rear of the pattern plate is essentially flush with the front of respective pattern fixture and a second position in said moulding chamber in which second position the rear surface of a pattern plate is adjacent the front face of a respective pattern fixture;

said method comprising

providing a rotatable member comprising means for holding said pattern plates on said rotatable member such that the rear surface thereof extends in a plane substantially parallel to a plane which includes the axis of rotation of said rotatable member and which is spaced a distance from said plane; and

rotating said rotatable member to bring each respective pattern plate into said first position.

2. Moulding apparatus comprising:

a moulding chamber;

pattern fixtures in said moulding chamber for moulding an article between opposed front faces of said pattern fixtures;

means for releasably securing a pattern plate to respective opposed front faces of said pattern

means for conveying pattern plates to said pattern fixtures; fixtures by a transverse sliding movement between a first position outside said moulding chamber in which first position the rear of a pattern plate is essentially flush with the front of a respective pattern fixture and a second position in said moulding chamber in which second position the rear surface of a pattern plate is adjacent the front face of a respective pattern fixture; and

means for changing pattern plates in said moulding apparatus comprising:

a rotatable member;

means for holding said pattern plates on said rotatable member such that the rear surface thereof extends in a plane substantially parallel to a plane which includes the axis of rotaton of said rotatable member and which is spaced a distance from said plane; and

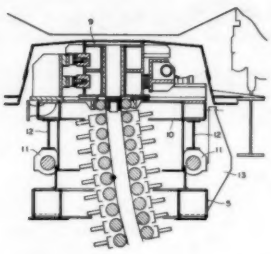
means for rotating said rotatable member to bring each respective pattern plate into said first position.

4,678,022

MOLD-OSCILLATING APPARATUS IN A CONTINUOUS CASTING ASSEMBLY

Herbert Lemper, McMurray, Pa., assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 3, 1986, Ser. No. 835,802
Int. Cl.[4] B22D *11/04*
U.S. Cl. 164—416 **6 Claims**



1. A mold-oscillating apparatus in a continuous casting assembly, comprising:

a mold table;

a base frame;

first and second driven eccentric shafts;

drive means connected to each of said first and second shafts;

first and second stationary bearing housings connected to said base frame and within which said first and second shafts are respectively mounted;

first and second moving bearing housings connected to said mold table and within which said first and second shafts are respectively mounted; and

a connecting beam interconnecting said mold table with said first and second moving bearing housings wherein said mold table is oscillated via said connecting beam upon rotation of said first and second shafts by said drive means.

4,678,023

CLOSED LOOP DELIVERY GAUGE CONTROL IN ROLL CASTING

David J. Knapp, Monroeville, and Marion D. Waltz, Tarentum, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 24, 1985, Ser. No. 812,996
Int. Cl.[4] B22D *11/16*
U.S. Cl. 164—452 **9 Claims**

1. An integrated process for automatically controlling the position of solidification of molten metal in the bite of rotating rolls of roll casting apparatus, and compensating for roll eccentricity, without coupling of the two efforts, the process comprising the steps of:

rotating the rolls,

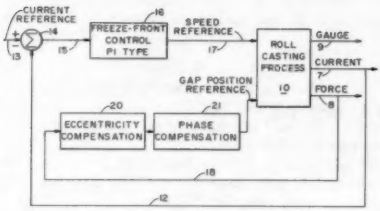
supplying molten metal to the bite of the rolls,

solidifying the metal in said bite and directing the same through a gap provided between the rolls,

measuring a casting parameter and providing therefrom a time based value representing the actual position of metal solidification in the roll bite,

providing a reference value of said parameter,

obtaining a value representative of any difference occurring between the reference and solidification position values, and utilizing the same to properly position solidification,



estimating from a time based casting parameter the frequency of the eccentricity of the rolls, and developing therefrom a frequency based eccentricity value, and

utilizing the frequency based eccentricity value to cyclically change the size of gap between the rolls to offset the effects of eccentricity on the gauge of solid metal exiting the rolls without influencing the ability to control the position of solidification in the roll bite.

4,678,024

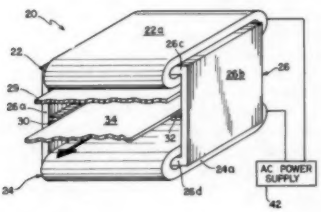
HORIZONTAL ELECTROMAGNETIC CASTING OF THIN METAL SHEETS

John R. Hull, Hinsdale; Robert J. Lari, Aurora; Walter F. Praeg, Palos Park, and Larry R. Turner, Naperville, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1986, Ser. No. 872,725

Int. Cl.[4] B22D *27/02*

U.S. Cl. 164—503 **33 Claims**



1. Apparatus for the horizontal casting of thin metal sheets comprising:

vessel means containing a molten metal and including an aperture for discharging said molten metal in the form of a thin, horizontal sheet;

electromagnetic conducting means positioned adjacent to the aperture in said vessel means and in spaced relation from said molten metal sheet for directing a horizontal magnetic field across and about said molten metal sheet; and

conductive shield means positioned within said magnetic field and electrically coupled to said molten metal sheet for defining a horizontally oriented equilibrium position of the molten metal sheet within said magnetic field wherein the strength of said magnetic field increases with increasing displacement of said molten metal sheet below said equilibrium position and decreases with increasing displacement of said molten metal sheet above said equilibrium position such that said magnetic field exerts a constant, uniform levitation force on said molten metal sheet.

4,678,025

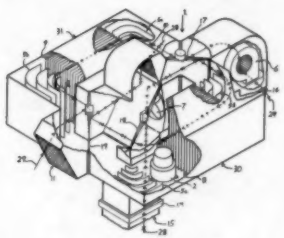
HEATING/COOLING/VENTILATION UNIT

George H. Oberlander, P.O. Box 1505, Watertown, S. Dak. 57201, and Keith E. Stormo, 32483 Oakville, Space 74, Albany, Oreg. 97321

Continuation of Ser. No. 526,641, Aug. 26, 1983, abandoned. This application Jan. 10, 1986, Ser. No. 817,810

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—12 **5 Claims**



1. Heating/cooling/ventilation unit comprising:

a. a casing having a condenser plenum and an evaporator plenum, said condenser plenum having a first and second end and said evaporator plenum having a first and second end, said casing having two outside air ports, an inside air outlet, and an inside air inlet connected to said plenums;

b. a compressor connected to an evaporator with evaporator fins and connected to a condenser with condenser fins housed within said condenser plenum and said evaporator plenum;

c. turning vanes housed within said plenums;

d. an outside damper pivotably connected to said casing and positioned between the first end of the evaporator plenum and the first end of the condenser plenum, a cycling damper pivotably connected within said inside air outlet and positioned between the second end of the evaporator plenum and the second end of the condenser plenum, and a return damper between the outside damper, said cycling damper, said inside air inlet and one of the outside air ports;

e. means for controlling said cycling damper; and

f. a supply fan located between an inside air inlet and an outside air inlet both of which are interconnected to said plenums and a return fan within an inside air outlet interconnected to said plenums and an outside air outlet interconnected to said plenums.

4,678,026

COOLER FOR A WATER COOLED INTERNAL COMBUSTION ENGINE

Werner Lenz, Mühlacker, and Manfred Möst, Tamm, both of Fed. Rep. of Germany, assignors to Suddeutsche Kuhlerfabrik Julius Fr Behr GmbH & Co., Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,286

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428857

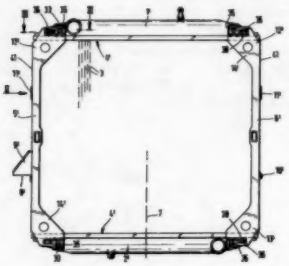
Int. Cl.[4] F28F *9/00*; F28D *1/00*

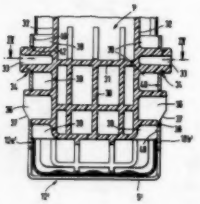
U.S. Cl. 165—67 **15 Claims**

1. A radiator assembly for a water cooled internal combustion engine having upper and lower water tanks, cooling block means for communicating fluid flow between said upper and lower water tanks and lateral part means for connecting said upper and lower water tanks, each said upper and lower tank

having longitudinal sides, two end sides and a surface connecting said longitudinal sides and the two end sides,

said lateral part means comprising a pair of parallel fastening bracket means for engagement with both said longitudinal sides of said water tanks, said fastening bracket means being elastically deformable in directions away from said longitudinal sides,





said water tanks having connection pin means extending from said longitudinal sides, said pin means exhibiting a slanted surface for elastically deforming said fastening bracket means during slideable engagement of said fastening bracket means with said pin means,

said fastening bracket means having openings for engagement of said connection pin means extending through said openings.

4,678,027

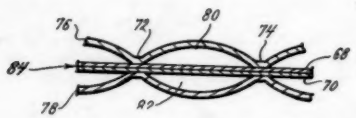
DUAL-WALLED COILED PLATE HEAT EXCHANGER WITH VENTED INTERFACE

Phillip G. Shirey, Nixa; David W. Rowe, Springfield, and William R. Waynick, Walnut Grove, all of, assignors to Paul Mueller Company, Springfield, Mo.

Filed Dec. 14, 1984, Ser. No. 681,873

Int. Cl.[4] F28F *11/00*

U.S. Cl. 165—70 **13 Claims**



11. A coiled plate-type heat exchanger, said heat exchanger being comprised of two pairs of plates, means sealing the first pair of plates to each other substantially adjacent their periphery, means sealing the second two plates together substantially adjacent their periphery, means sealing said pairs together along at least a portion, but less than all, of their periphery, at least one plate of each pair being at least partially expanded away from its associated plate to thereby form a passageway therebetween for the circulation of a fluid, one of said pairs being adapted to circulate refrigerant therethrough, the other of said pairs being adapted to circulate potable water therethrough, and means joining the pairs together in close thermal contact, said joining means comprising a plurality of spaced spot welds, at least some of the welds extending through both pairs of plates, said sealing means thereby forming a vented interface between the interior of said pairs, said heat exchanger being coiled into an annular configuration and means to fix said heat exchanger in said annular configuration.

4,678,028

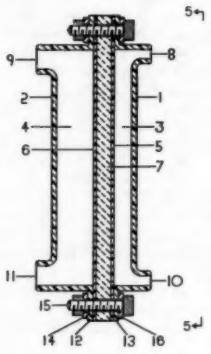
PLASTIC LABORATORY CONDENSER

Louis A. Conant; Wilbur M. Bolton, both of Rochester, and James E. Wilson, Livonia, all of N.Y., assignors to Intertec Associates Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 703,344, Feb. 20, 1985, abandoned. This application Jan. 21, 1986, Ser. No. 820,125

Int. Cl.[4] F28B *1/02*

U.S. Cl. 165—72 **36 Claims**



1. An impact resistant compact condenser comprising a plastic shell having two side walls enclosing at least one heat transfer disc having generally smooth side surfaces, said at least one heat transfer disc being disposed between said side walls dividing said shell into at least one cooling cell and at least one unobstructed vapor cell, means for retaining said disc in sealed abutment against said end walls of said side walls, each of said cells having an inlet port and an outlet port, said outlet port of said vapor cell being positioned so as to allow gravity flow of condensate therefrom.

4,678,029

EVAPORATING HEAT TRANSFER WALL

Toshi Sasaki, Hitachiota; Hiromichi Yoshida; Shigeho Fukuda, both of Hitachi; Kiyoshi Oizumi, Tsuchiura; Kimio Kakizaki, Hitachi; Wataru Nakayama, Kashiwa; Takahiro Daikoku, Ushiku; Tadakatsu Nakajima, Shimoinayoshi, and Yoshihiko Nakayama, Sakura, all of Japan, assignors to Hitachi Cable, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 652,294

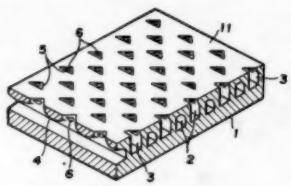
Claims priority, application Japan, Sep. 19, 1983, 58-172810

Int. Cl.[4] F28F *13/18, 19/02*

U.S. Cl. 165—133 **19 Claims**

13. An evaporating heat transfer wall having a number of fine and elongate tunnels adjacent to each other and positioned a minute distance under the wall surface, a number of discrete small closely spaced openings for communicating said tunnels to the outside of said wall by extending from the ceilings of said tunnels to the wall surface, a plurality of tongue-like pro-

jections protruding convexly when viewed perpendicularly to said heat transfer wall surface, and each projection associated with and extending from an edge wall of a respective opening or a vicinity of such opening to extend across said opening leaving a continuous gap having at least one first gap portion and at least one second gap portion which second gap portion is dimensionally narrower than said first gap portion and



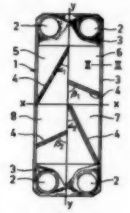
which has relatively higher resistance to fluid flow than said first gap portion such that vapor bubbles formed in the tunnel preferentially pass through said first gap portion and liquid can simultaneously enter said tunnel by capillary action through said second gap portion, the upper and lower surfaces of each tongue-like projection being inclined in the same general direction relative to the surface of said heat transfer wall within a range of from 5 to 80 degrees.

4,678,030

PLATE HEAT EXCHANGER

Christer Almqvist, Täby, Sweden, assignor to Reheat AB, Taby, Sweden

Filed Nov. 29, 1985, Ser. No. 802,823
Claims priority, application Sweden, Jun. 6, 1985, 8502802
Int. Cl.[4] F28F *3/04*
U.S. Cl. 165—166 **4 Claims**



1. A plate heat exchanger comprising: a plurality of heat exchanger plates placed close to and sealed against each other and having respective pressed-out ridges to form a heating surface of each respective plate including two different flow passages forming a heat exchanger body wherein said heat exchanger plates are generally alike, a packing groove having a bottom disposed in a central plane of each said plate, said heating surface being divided into at least two area portions, ones of said ridges in one area portion having a first angle relative to symmetry axes X and Y, respectively of said plate lying in a plane of said plate which is different from a second angle formed by ones of said ridges in the other said area portion with symmetry axes thereof and one or more of the other ones of said plates included in said heat exchanger body being disposed at an angle of approximately 180 degrees about one of said symmetry axes (x,y) starting from the orientation of one plate in said heat exchanger body;

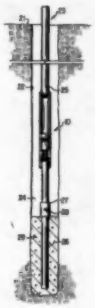
and wherein said symmetry axes of said plate included in said heat exchanger body defines four area portions.

4,678,031

ROTATABLE RECIPROCATING COLLAR FOR BOREHOLE CASING

David M. Blandford, 160 Sage Rd., Juniper Heights, Durango, Colo. 81301, and John H. Easter, 2418 Greenbriar, Abilene, Tex. 79605

Filed Jan. 27, 1986, Ser. No. 823,183
Int. Cl.[4] F16L *35/00;* **E21B** *17/14*
U.S. Cl. 166—242 **9 Claims**



1. A rotatable reciprocating collar for series connection into a borehole casing string between an upper segment and a lower segment of the casing string to assist in a multistage cementing operation, means being provided for passing cement from the interior of the casing string to the annulus between the casing string and borehole proximate the collar, comprising:

an open cylindrical barrel having a first barrel end, a second barrel end, and an inner surface;

a plurality of barrel splines projecting radially inward from said inner surface at said first barrel end;

an open cylindrical mandrel having a first mandrel end, a second mandrel end, and an outer surface;

a plurality of mandrel splines projecting radially outward from said outer surface at said first mandrel end;

said mandrel slidably disposed within said barrel such that said second mandrel end is telescopically extendable from said first barrel end;

wherein said mandrel splines engage said barrel splines when said second mandrel end is telescopically extended from said first barrel end and said mandrel splines disengage said barrel splines when said mandrel is telescopically retracted into said barrel; and

said second barrel end being connected to one of said segments of the casing string and the second mandrel end being connected to the other of said segments to permit rotation and reciprocation of the upper segment relative to the lower segment during a multistage cementing operation, the collar remaining permanently within the borehole after cementing to form a portion of the casing.

4,678,032

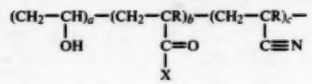
POLYMER AND METHOD FOR PERMEABILITY PROFILE CONTROL UNDER SEVERE RESERVOIR CONDITIONS

Paul Shu, Princeton Junction, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 23, 1986, Ser. No. 866,634
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—295 **8 Claims**

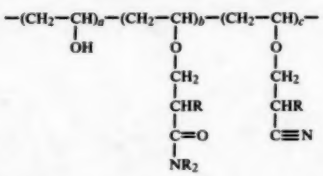
1. Method for treating a subterranean formation by reducing formation permeability, said formation penetrated by at least one well bore, comprising:

a. injecting into the formation through said well bore a first polymer solution which includes a polymer



I

poly(vinylalcohol-co-vinylether),



II

wherein:

R is H, alkyl, alkyl sulfonate or aryl groups having not more than 10 carbon atoms;

X is NR_2, OH, OR, O^-, alkylammonium, or alkylsulfonate; and

a, b, and c are mole fractions of each co-monomer unit such that $a+b+c=1$, $a>0$, $b>0$, and

b. injecting a solution containing a complexing ion selected from the group consisting of multivalent transition metals of the Group IIIa–VIa, VIII, and Ib–Vb of the Periodic table.

4,678,033

HYDROCARBON RECOVERY PROCESS

John E. Killough, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 8, 1986, Ser. No. 904,532

Int. Cl.[4] E21B *43/22*

U.S. Cl. 166—246 **23 Claims**

1. A process for recovering hydrocarbons from a subterranean, hydrocarbon-bearing formation comprising:

(a) introducing microbes into said formation, said microbes being capable of acting to render at least a portion of said hydrocarbons in said formation more easily recoverable;

(b) passing electrical energy through at least a portion of said formation without substantially raising the temperature of the formation; and

(c) recovering hydrocarbons from said formation.

4,678,034

WELL HEATER

Bernard J. Eastlund, Spring; Kenneth J. Schmitt, The Woodlands, and Ronald M. Bass, Houston, all of Tex., assignors to Formation Damage Removal Corporation, Spring, Tex.

Continuation of Ser. No. 762,697, Aug. 5, 1985, abandoned. This application May 23, 1986, Ser. No. 867,338

Int. Cl.[4] E21B *36/00*

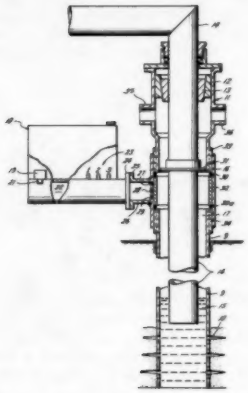
U.S. Cl. 166—248 **20 Claims**

1. A system for heating a well tubing comprising,

a petroleum well having a metal casing and a metal wellhead at the upper end of the casing,

a metal tubing suspended from said wellhead within said casing and providing with said casing an annular area adjacent to said wellhead, and

means for generating in said annular area microwaves in at least one mode which naturally occurs in and is transmitted axially along said annulus including a source of micro-



waves at 2450 MH_z and a wave guide exterior of the well communicating such source with said annular area.

4,678,035

METHODS AND APPARATUS FOR SUBSURFACE TESTING OF WELL BORE FLUIDS

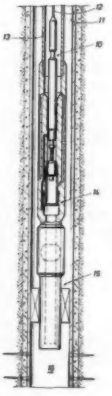
Pierre Goldschild, Vulaines-sur-Seine, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 630,033, Jul. 12, 1984, abandoned. This application Dec. 27, 1985, Ser. No. 813,792

Claims priority, application France, Jul. 12, 1983, 83 11629

Int. Cl.[4] E21B *34/14, 43/12, 47/06*

U.S. Cl. 166—250 **17 Claims**



1. A method for testing a production well having a production string therein including a packer isolating a lower well bore interval, a pipe string coupled to said packer and extending to the surface, means including a valve having an actuator operable in response to its upward and downward movement for controlling the flow of connate fluids from said isolated well bore interval into said pipe string, and means defining a measuring station above said valve having passage means in

communication with said isolated well bore interval, and comprising the steps of:

connecting a suspension cable to a testing tool carrying fluid-measuring means adapted to measure a characteristic of connate fluids and including anchoring means adapted to be engaged with said measuring station and subsequently released therefrom only after a predeterminded number of successive upward and downward movements of said suspension cable so that a corresponding number of said multiple measurements can be obtained before said anchoring means are released, and coupling means adapted to be releasably coupled to said actuator when said anchoring means are engaged with said measuring station;

lowering said testing tool into said production string until said anchoring means are engaged with said measuring station for communicating said fluid-measuring means with said passage means and coupling said coupling means to said actuator; and

successively moving said suspension cable upwardly and downwardly for repetitively opening and closing said valve to obtain multiple measurements of said fluid characteristic before said anchoring means are released from said measuring station.

4,678,036

MISCIBLE OIL RECOVERY PROCESS

Kathy J. Hartman, Arlington, and Winston R. Shu, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 22, 1985, Ser. No. 704,232
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 **30 Claims**

1. A method for the recovery of oil from a subterranean, oil-bearing reservoir penetrated by an injection well and a production well extending from the surface of the earth into the reservoir, which method comprises:

(i) injecting into the reservoir through the injection well, a mixture of a multiple contact miscible solvent for the oil and a solubility improving additive in an amount sufficient to lower the minimum miscibility pressure to a value no higher than the reservoir pressure thereby attaining multiple contact miscibility as said solvent begins to penetrate said reservoir;

(ii) producing fluids including oil from the production well; and

(iii) continuing to inject the mixture of solvent and solubility additive into the reservoir with a reduced proportion of the additive in the mixture relative to the initially injected mixture.

4,678,037

METHOD AND APPARATUS FOR COMPLETING A PLURALITY OF ZONES IN A WELLBORE

Michael B. Smith, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

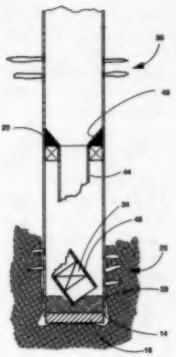
Filed Dec. 6, 1985, Ser. No. 806,254
Int. Cl.[4] E21B *29/02*
U.S. Cl. 166—299 **22 Claims**

1. A method for permitting fluid flow from a plurality of subterranean zones into a wellbore, there being at least an upper and lower perforated zone, comprising the steps of:

perforating the lower zone;

creating a seal in the wellbore between the upper and lower zones prior to perforating the upper zone to allow fracturing of the upper zone without establishing fluid communication with the lower zone;

perforating the upper zone;



fracturing the upper zone; and

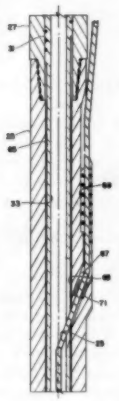
explosively releasing the seal between said upper and lower zones without fracturing the formation in either zone.

4,678,038

SIDE ENTRY SUB WELL LOGGING APPARATUS AND METHOD

E. Edward Rankin, 3550 Wind River Ct., Ridglea Country Club Estates, Fort Worth, Tex. 76116

Filed Mar. 7, 1986, Ser. No. 837,383
Int. Cl.[4] E21B *17/046*
U.S. Cl. 166—301 **15 Claims**



1. In a well logging system in which conductor cable extends outside of a string of drill pipe into a sidewall passage of a side entry sub and through the drill pipe to a logging instrument located at the lower end of the drill pipe, an improved apparatus for releasing the side entry sub from the drill pipe if the drill pipe becomes stuck, comprising:

a release sub adapted to be connected to the drill pipe below the side entry sub;

a tubular mandrel adapted to be carried in the side entry sub and to extend into the release sub, the mandrel having aperture means for receiving the cable passing through the sidewall passage of the side entry sub, the mandrel being

moveable relative to the side entry sub under sufficient fluid pressure from an upper position to a lower position;

latch means for latching the side entry sub to the release sub, and when engaged by the mandrel in its lower position, for releasing the side entry sub from the release sub to enable the side entry sub to be pulled upward; and

blockage means adapted to be lowered into the drill pipe from the surface into contact with the upper end of the mandrel for blocking flow through the mandrel, enabling fluid pressure to be applied through the drill pipe from the surface to the mandrel to move the mandrel to the lower position.

4,678,039

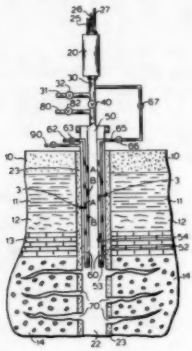
METHOD AND APPARATUS FOR SECONDARY AND TERTIARY RECOVERY OF HYDROCARBONS

Nelson Rivas, Hempstead, N.Y., and Rudi Beichel, Sacramento, Calif., assignors to WorldTech Atlantis Inc., New York, N.Y.

Filed Jan. 30, 1986, Ser. No. 824,171

Int. Cl.[4] E21B *36/02, 43/24*

U.S. Cl. 166—303 **5 Claims**



1. Apparatus for secondary and tertiary recovery of hydrocarbons from oil fields comprising:

a. a bipropellant generator capable of producing exhaust gases at supercritical pressures and tempertures;

b. transport means for carrying said exhaust gases into a well bore, at least a portion of said well bore extending into a hydrocarbon bearing formation from which hydrocarbons are to be recovered;

c. means for introducing water into said transport means; and

d. a water cooling jacket extending into at least the upper portion of said well bore, the center of said cooling jacket receiving said exhaust gases from said transport means, means being provided for the introduction of chemical additives through a portion of said cooling jacket.

2. A process for secondary and tertiary recovery of hydrocarbons from geological formations comprising:

a. providing a well bore extending at least into the strata of said geologic formation containing said hydrocarbons to be recovered;

b. providing at least the upper portion of said well bore with a cooling jacket, said cooling jacket being provided with a central, open portion;

c. generating gases at supercritical temperatures and pressures;

d. introducing water into said supercritical gases to form steam;

e. forcing said mixture of supercritical combustion gases and steam through the central open portion of said cooling jacket and said well bore into said hydrocarbon strata; and

f. adding chemical additives to said mixture of combustion gases and steam below said cooling jacket.

4,678,040

METHODS AND APPARATUS FOR RECOVERY OF HYDROCARBONS AND OTHER LIQUIDS FROM UNDERGROUND

Wayne C. McLaughlin, St. Charles; William J. Recker, Bloomingdale; Phillip C. Modesitt, Chicago, and Paul K. Francescon, Coal Valley, all of Ill., assignors to Pump Engineer Associates, Inc., Addison, Ill.

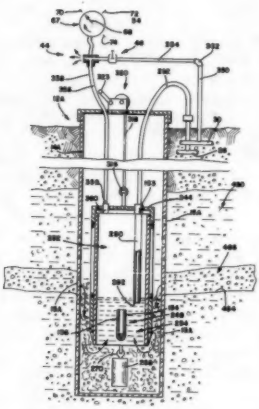
Continuation-in-part of Ser. No. 691,166, Jan. 14, 1985, Pat. No. 4,625,801, which is a continuation-in-part of Ser. No. 513,264, Jul. 13, 1983, Pat. No. 4,527,633. This application Dec. 3, 1985, Ser. No. 804,265

Claims priority, application Canada, Jul. 4, 1984, 458105

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] E21B *43/12, 44/16;* **F04F** *1/08*

U.S. Cl. 166—370 **9 Claims**



9. An ejector pump comprising:

a rigid, elongated, tubular body defining a pump chamber;

said tubular body having an upper end and a lower end,

liquid outflow conduit means positioned in an opening in said upper end of said body for conveying liquid from said chamber and comprising check valve means for preventing flow of liquid into said chamber through said conduit means; the input end of said outflow conduit means being positioned in said chamber near said lower end of said body and the output end of said outflow conduit means extending outside said body;

liquid inflow conduit means posiitoned in a second opening in said upper end of said body for conveying liquid into said chamber and comprising check valve means for preventing flow of liquid out of said chamber through said inflow conduit means; and

other conduit means postioned in a third opening in said upper end of said body for conveying gases from and to said chamber for selectively venting and pressurizing said chamber.

4,678,041

FIRE FIGHTING SERVICE VEHICLE

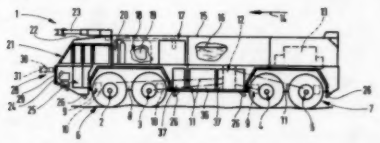
Hermann Staudinger, Neuhofen, Austria, assignor to Konrad Rosenbauer KG., Leonding, Austria

Filed Mar. 14, 1985, Ser. No. 711,617

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409807

Int. Cl.[4] B60P *3/00;* **B62D** *63/02;* **A62C** *27/20*

U.S. Cl. 169—24 **22 Claims**



1. A service vehicle for use as a fire-fighting tanker vehicle comprising an uninterrupted chassis frame carrying a driver's cab and supported by four driving axles driven independently of each other by a driving engine, the four driving axles being carried on the chassis frame via pressure fluid springs at opposite sides of the vehicle and the pressure fluid springs associated with wheels at one side being connected via a pressure fluid supply system and a load compensator system to the pressure fluid springs associated with wheels situated at the other side of the vehicle, an automatic transmission situated between front and rear undercarriages each comprising two of said driving axles, the driving axles of each undercarriage being separately coupled to the automatic transmission which is coupled to the driving engine situated on the chassis from above the rear undercarriage, and quenching agent tanks and a quenching agent pump arranged on the chassis.

4,678,042

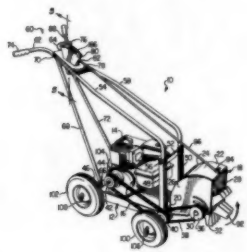
METHOD AND APPARATUS FOR CUTTING AN ATHLETIC FIELD LINE

James W. Barton, and Hubert D. Allen, both of Rockwall, Tex., assignors to Tamer Corporation, Rockwall, Tex.

Filed Sep. 27, 1985, Ser. No. 780,982

Int. Cl.[4] A01B *45/04*

U.S. Cl. 172—15 **14 Claims**



1. Apparatus for cutting an athletic field line, comprising:

a chassis including a front end and a rear end;

a plurality of wheels including a pair of laterally spaced rear wheels for supporting said chassis in a fixed attitude relative to the ground and for locomotion across the ground in a predetermined line of travel;

drive means mounted on said chassis;

a cutter head mounted on the front end of said chassis by means of a hinge substantially parallel to the ground and substantially perpendicular to said predetermined line;

an axle rotatably mounted on said cutter head and spaced forward of and disposed substantially parallel to said hinge;

a plurality of cutter blades mounted on said axle to skim the earth for removing a continuous strip of grass and the like from a band of earth between said rear wheels, said strip being substantially narrower than the space between said rear wheels straddling said predetermined line to form an athletic field boundary line, said blades rotating so as to throw cut grass and the like forward of the apparatus;

said drive means coupled to said rotating axle for supplying power to said axle and cutter blades;

an operator station at said rear end at which an operator directs the apparatus over the ground on said predetermined line, said cutter head and said operator station substantially centered on and colinear with said predermined line; and

means at said operator station and coupled to said cutter head for adjusting the level of said cutter head relative to the ground.

4,678,043

HAND TOOL FOR LOOSENING SOIL

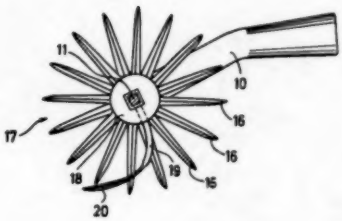
Hans vom Braucke, Vlotho; Manfred vom Braucke, and Dieter Westerwelle, both of Bielefeld, all of Fed. Rep. of Germany, assignors to Bielefelder Kuchenmaschinen-und Transportgeratefabrik vom Braucke GmbH, Bielefeld, Fed. Rep. of Germany

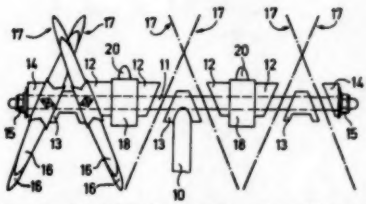
Filed Jan. 11, 1985, Ser. No. 690,765

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3401000; Sep. 28, 1984, 3435601

Int. Cl.[4] A01B *1/06, 1/20*

U.S. Cl. 172—349 **15 Claims**





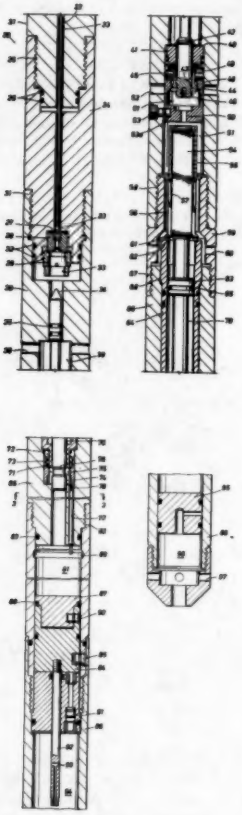
1. A hand tool for loosening, cutting and crumbling garden soil or the like, including axle means, connecting means connected to said axle means for premitting displacement of said tool, at least two pronged wheels each of said wheels having radially extending prongs and being freely rotatably mounted on bearing sleeves non-rotatably mounted on said axle means, said pronged wheels having vertical central planes extending in the direction of the radially extending prongs and at least some of the adjacent pronged wheels intersecting each other at an acute angle and wherein at least one spade-type prong is supported on said axle means and terminates in enlarged end means and is disposed along said axle means between every other adjacent pair of said pronged wheels, each said spade-type prong being formed with with said end means protruding outwardly from said axle means beyond the radially extending prongs of the pronged wheels, said bearing sleeves on which said intersecting pronged wheels are mounted facing one another at an acute angle to form V-like arrangements, and intermediate guide bearings are disposed between said bearing sleeves and are mounted together with the bearing sleeves on said axle means so as to be non-rotatable and displaceable in the longitudinal direction of the axle means, each said spade-type prong being rigidly secured to a coaxial bearing sleeve which is non-rotatably mounted on said axle means.

4,678,044

TUBING PRESSURE OPERATED INITIATOR FOR PERFORATING IN A WELL BOREHOLE

Robert R. Luke, Houston; James M. Barker, Katy, both of Tex.; Michael L. Smith, Sand Springs, Okla.; Larry L. Grigar, East Bernard, and Carl B. Miller, Houston, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 31, 1986, Ser. No. 846,405
Int. Cl.[4] E21B *43/1185*
U.S. Cl. 175—4.52 22 Claims



1. A method of perforating a well below a packer comprising the steps of:

(a) positioning a perforating gun assembly on a tubing string at a specified depth in a well below a packer;

(b) selecting a pressure in excess of bottom hole pressure at which a perforating gun detonator means is operated;

(c) increasing the pressure below the packer by pumping a fluid through the tubing into the volume below said packer at least to that pressure required for perforating gun detonator means operation;

(d) firing the perforating gun detonator means by arming the perforating gun detonator means by exceeding the pressure required to move a piston in a cylinder within said perforating gun detonator means to an armed position; and

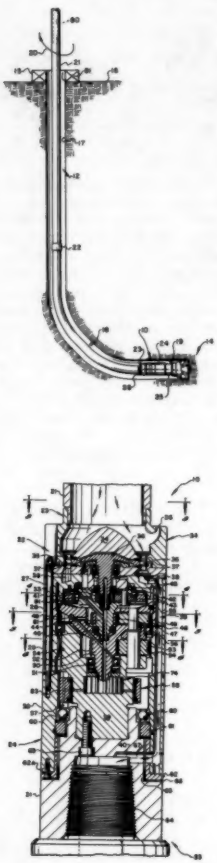
(e) locking the piston in the cylinder after movement to the armed position.

4,678,045

TURBINE TOOL

William C. Lyons, P.O. Box 2457, Santa Fe, N. Mex. 87504-2457

Continuation-in-part of Ser. No. 514,865, Jul. 18, 1983, abandoned. This application Oct. 8, 1985, Ser. No. 785,492
Int. Cl.[4] E21B *4/02, 7/04*
U.S. Cl. 175—61 3 Claims



1. In a borehole forming operation wherein a rotary drill bit forms a borehole which extends along a relatively straight line and then makes a turn of a very small radius of curvature and then extends along another relatively straight line as the borehole penetrates a payzone, the method of drilling said borehole comprising the steps of:

(1) flowing power fluid down a flexible drill pipe string; said flexible drill pipe string has the capability of negotiating said turn of very small radius while concurrently conducting said power fluid therethrough;

(2) attaching a turbine motor having an output shaft to the end of said drill pipe string, and using the power fluid for driving the output shaft of the turbine;

(3) series connecting a plurality of planetary reduction gear assemblies together and to the output shaft of the turbine; said gear assemblies having input and output shafts; and,

arranging the input and output shafts of the reduction gear assemblies along a common axial centerline;

(4) enclosing the planetary reduction gear assemblies within a housing which includes an oil chamber, circulating oil from said oil chamber, to said planetary reduction gear assemblies, and back to said oil chamber to thereby provide a closed lubrication system for said planetary reduction gear assemblies;

(5) carrying out step (4) by placing an oil pick-up ring about an oil pump; forming a plurality of radial passageways from the pump outwardly into communication with the oil pick-up ring; making one side of the oil pick-up ring heavier respective to another side of the ring so that the heavy side of the ring gravitates into the oil located within the oil chamber, thereby providing the suction side of the oil pump with an oil supply, regardless of the orientation of the housing;

(6) turning a rotary drill bit with the output shaft of the last of the series connected reduction gear assemblies;

(7) using the spent power fluid from the turbine for drilling fluid by conducting the spent power fluid from the turbine, through a passageway formed externally of the reduction gear assemblies and to the bit; and,

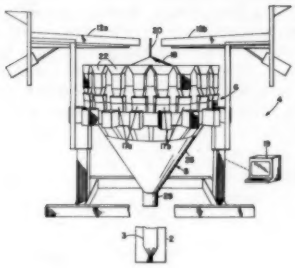
(8) overcoming the torque of the bit while forcing the bit towards the formation by directing a flow of power fluid through a reaction port which is arranged in opposition to the direction of penetration of the drill bit, and at an angle to provide a force which is in opposition to the drill bit torque.

4,678,046

COMBINATION WEIGHING APPARATUS FOR TWO COMBINED PRODUCTS

Oren A. Mosher, Hayward, Calif., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Jan. 31, 1986, Ser. No. 824,842
Int. Cl.[4] G01G *19/22*
U.S. Cl. 177—1 **32 Claims**



1. A combination weighing system for weighing out quantities of at least two of different types of products to contribute to a package, said system comprising:

a first plurality of weighing scales for weighing out quantities of a first product,

a second plurality of weighing scales for weighing out quantities of a second product, said first product being a different type than said second product,

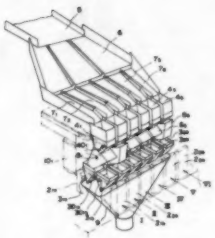
combination search means for selecting from said first plurality of weighing scales a combination which contains a combined quantity of said first product near in weight to a predetermined fractional target weight, and for selecting from said second plurality of weighing scales a combination which contains a combined quantity of said second product near in weight to the difference between a combined target weight for said first and said second types of products within said package and the weight of said first product within the selected combination of said first plurality of scales.

4,678,047

ARTICLE SUPPLY FOR A COMBINATORIAL WEIGHING MACHINE

Koichi Kataoka, Shiga, and Takashi Kabumoto, Mukou, both of Japan, assignors to Kabushiki Saisha Ishida Koki Seisakusho, Kyoto, Japan

Continuation of Ser. No. 572,315, Jan. 20, 1984, abandoned. This application Apr. 2, 1986, Ser. No. 847,092
Claims priority, application Japan, Jan. 20, 1983, 58-008320
Int. Cl.[4] G01G *19/22, 21/28*
U.S. Cl. 177—1 **10 Claims**



1. A method of supplying articlles to be weighed in an automatic weighing system having plural weighing hopper sets each of which includes a pair of weighing hoppers attached to respective ones of plural weighing machines, a pool hopper and a director chute provided for the pair of weighing hoppers in each weighing hopper set, a drive apparatus provided for each weighing hopper set for operating the corresponding pool hopper and the corresponding director chute to selectively supply articles from the pool hopper and the director chute to the pair of weighing hoppers in the weighing hopper set, and a control apparatus for controlling the drive apparatus, said method comprising the steps of:

(a) computing combinations by means of the control apparatus on the basis of weight values from the plurality of weighing machines;

(b) discharging articles from selected weighing hoppers in response to a first command sent from the control apparatus to the drive apparatus for each weighing hopper set which includes one of the selected weighing hoppers forming a part of an optimum combination from the optimum combinations computed in said step (a), by causing the drive apparatus to open the selected weighing hoppers which correspond to the optimum combination;

(c) selectively sending a tilt command from the control apparatus to the drive apparatus for each weighing hopper set which includes one of the selected weighing hoppers to cause the drive apparatus to tilt only the director chutes corresponding to the weighing hopper sets from which articles have been discharged, toward the corresponding selected weighing hoppers; and

(d) supplying articles from the pool hoppers to the corresponding selected weighing hoppers which have discharged their articles, in response to a second command sent from the control apparatus to the drive apparatus, the second command causing the drive apparatus for the weighing hopper sets which include one of the selected weighing hoppers to open only the pool hoppers corresponding to the weighing hopper sets from which articles have been discharged.

4,678,048

APPARATUS FOR THE CONTACTLESS COUPLING OF A SUSPENDED PART TO FORCE MEASURING DEVICE

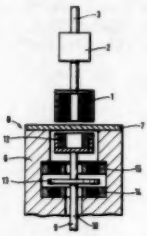
Hans-Wilhelm Lösch, Emscherstrasse 8,, 4630 Bochum 1; Rainer Kleinrahm, Röntgenring 2, 4030 Ratingen; Norbert Pieperbeck, Barlachweg 42, 4630 Bochum 1, and Wolfgang Wagner, Virchowstrasse 7, 4630 Bochum 1, all of Fed. Rep. of Germany

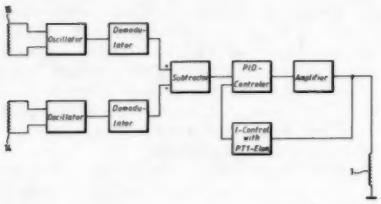
Filed Jul. 30, 1985, Ser. No. 760,657

Claims priority, application European Pat. Off., Aug. 2, 1984, 84109178.8

Int. Cl.[4] G01G *7/00, 3/14*

U.S. Cl. 177—212 12 Claims





1. Apparatus for the contactless coupling of a suspended part to a force measuring device, comprising a stationary housing for enclosing the suspended part with the force measuring device being above the housing, an electromagnet at the end of the measuring device facing said housing, a permanent magnet at the top of the suspended part adjacent the electromagnet, a second measuring device for measuring movements of the suspended part and thus of the permanent magnet, and a control loop electrically connected to said second measuring device and said electromagnet for receiving an input signal from said second measuring device and giving an output signal to said electromagnet to keep the suspended part in suspension, the improvement comprising said second measuring device being stationarily attached to said housing, for measuring the position of the suspended part relative to said housing in absolute terms against the stationary location of said housing and said control loop being connected to receive a value for the measured position, for comparing this value with a predetermined value of a preselected position and for controlling the electromagnet to keep the suspended part in its preselected position.

4,678,049

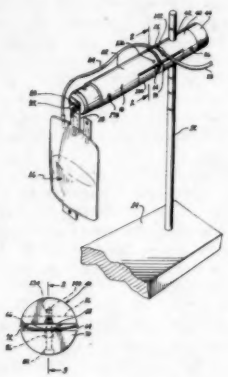
BLOOD COLLECTION BAG WEIGHT MONITOR

John B. Gummere, and Stephen C. Minney, both of Tucson, Ariz., assignors to Engineering & Research Associates, Tucson, Ariz.

Filed Oct. 17, 1985, Ser. No. 788,423

Int. Cl.[4] G01G *3/08, 19/00;* B65D *81/00*

U.S. Cl. 177—229 22 Claims



1. A weight monitor for monitoring the fill of a blood collection bag, said weight monitor comprising in combination:

(a) a fixed end;

(b) a movable end;

(c) means for suspending the blood collection bag from said movable end; and

(d) spring means for interconnecting said fixed end with said movable end and for repositioning said movable end from a first state to a second state on application upon said movable end of a predetermined force presented by the weight of a filled blood collection bag, said spring means having the characteristic of a buckling beam to abruptly reposition said movable end with a snap action upon application of the predetermined force and to essentially resist repositioning of said movable end in response to any applied force of a lesser magnitude than the predetermined force.

4,678,050

MASS AND FORCE METER

Johannes Wirth, and Mario Gallo, both of Zurich, Switzerland, assignors to K-Tron Patent AG, Zurich, Switzerland

Filed Jan. 13, 1986, Ser. No. 818,138

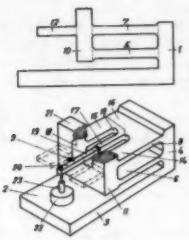
Claims priority, application European Pat. Off., Jan. 22, 1985, 85810017.5

Int. Cl.[4] G01G *3/08*

U.S. Cl. 177—229 10 Claims

1. In a mass and force meter with a single extruded profiled block and a motionless measuring system, said block presenting in cross-section several components which form a frame, a load support, a means for guiding said load support parallely and vertically, and a resilient transmission member that transmits a part of the load to the measuring system, said means consisting of at least two flat springs mounted one above the other, said flat springs being fitted in said frame and in said load support, said transmission member consisting of parts from

three different components of said block, one of said components comprising three strips forming parts of one of said flat



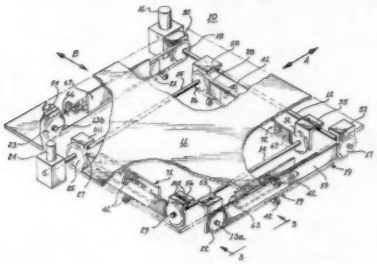
springs and one strip forming a part of said transmission member.

4,678,051

RECTILINEARLY TRAVELING VEHICLE

Thomas E. Dugle, 5000 Miami Rd., Cincinnati, Ohio 45243

Filed Apr. 23, 1986, Ser. No. 854,794
Int. Cl.[4] B62D *11/00, 57/00*
U.S. Cl. 180—9.1 **5 Claims**



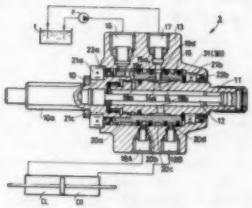
1. A vehicle, or the like, capable of moving in mutually perpendicular directions comprising, a supporting framework, a first pair of continuous link moving elements supported by said framework and oriented in one direction, said support by said framework of said first pair of continuous link moving elements including a first pair of plate means attached to said framework and each one extending substantially the full length of the respective one of said first pair of continuous link moving elements and each one having a lower guiding edge for supporting same continuously along substantially along said full length, a second pair of continuous link moving elements supported by said framework and oriented in a second direction perpendicular to said one direction, said support by said framework of said second pair of continuous link moving elements including a second pair of plate means attached to said framework and each one extending substantially the full length of the respective one of said second pair of continuous link moving elements and each one having a lower guiding edge for supporting same continuously along substantially said full length, the links in said first pair of moving elements comprising first roller means whose axes are parallel to said one direction, and the links in said second pair of moving elements comprising second roller means whose axes are parallel to said second direction.

4,678,052

POWER STEERING APPARATUS

Yoshio Suzuki, and Seiji Yamaguchi, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,438
Claims priority, application Japan, Mar. 13, 1984, 59-34893[U]
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—143 **8 Claims**



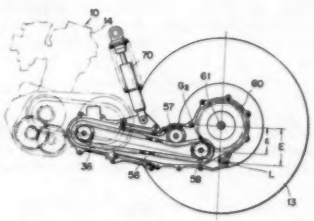
1. In a power steering apparatus comprising an oil pump adapted to supply pressurized oil from an oil tank to a flow control valve, said flow control valve being operable to selectively supply said oil to either a left or a right cylinder chamber of a power cylinder, and being adapted to return part of the pressurized oil discharged from said oil pump to said oil tank, the improvement wherein at least one orifice having a small opening is provided communicating a pressurized oil feed line directed to one of said chambers in said power cylinder with a return line directed to said oil tank from the other one of said chambers in said power cylinder at a downstream side of said flow control valve.

4,678,053

TILTABLE TRICYCLE

Masaki Watanabe; Hitoshi Yamamoto; Yoshinori Matsuoka, all of Saitama, and Kunihiko Tanaka, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 569,256, Jan. 9, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 918,635
Claims priority, application Japan, Jan. 8, 1983, 58-1549
Int. Cl.[4] B62D *61/06*
U.S. Cl. 180—210 **7 Claims**



1. A tiltable tricycle comprising:
(a) a body frame;
(b) a single front wheel steerably supported on a front portion of said body frame;
(c) a power unit mounted on a rear portion of said body frame and including at least an engine having a crankshaft;
(d) a joint case connected to said power unit for vertical angular movement and including a first speed reducer shaft rotatably supported therein and operatively connected to said crankshaft;
(e) a rear axle support case connected to said joint case for

lateral rolling movement and including a second speed reducer shaft rotatably supported therein;

(f) a secondary speed reducer mechanism incorporated in said rear axle support case;

(g) a rear axle assembly rotatably supported on said rear axle support case;

(h) a pair of rear wheels coupled to said rear axle assembly, respectively; and

(i) a shock absorber disposed between said body frame and said joint case;

said second speed reducer shaft being offset downwardly of said rear axle assembly.

4,678,054

BODY FRAMES

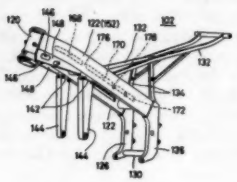
Kazuo Honda, Yokohama; Yoshiaki Horii, Niiza; Kinuo Hiramatsu, Wako; Shuhei Nakamoto, Yono, and Takashi Kudo, Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,281

Claims priority, application Japan, Dec. 26, 1984, 59-196041[U]; Mar. 6, 1985, 60-31964[U]; Mar. 19, 1985, 60-55098; Mar. 19, 1985, 60-55100

Int. Cl.[4] B62K *11/08, 19/30*

U.S. Cl. 180—225 **12 Claims**



1. A body frame structure for a saddle type motor vehicle comprising a head pipe and

a pair of main frame pipe members extending rearwardly from and attached at their front end to said head pipe,

at least one of said main frame pipe members having therein a longitudinally extending partition wall dividing said frame pipe member into a plurality of passages, each such passage forming a hollow section,

said plurality of passages including at least one passage closed at its opposite ends and having an inlet and an outlet, and at least one passage for wiring cables, including control cables, and a wire harness,

said wiring passage being closed at its opposite ends and having openings along one wall, said cables being clamped to said partition wall adjacent said openings by a fastener means.

4,678,055

FOUR-WHEEL VEHICLE DRIVE SYSTEM

Toshio Yoshinaka, Nagoya, and Syuji Nagano, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 22, 1986, Ser. No. 909,695

Claims priority, application Japan, Oct. 16, 1985, 60-158140[U]

Int. Cl.[4] B60K *41/26;* **F16H** *3/38*

U.S. Cl. 180—247 **35 Claims**

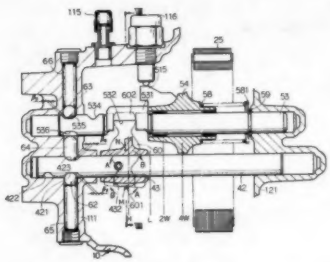
1. A four-wheel drive system for use in a vehicle including first and second pairs of road wheels, an engine including an output shaft, and a transmission including input and output shafts, the input shaft of the transmission being selectively connected to the output shaft of the engine, the output shaft of the transmission selectively being in driving engagement with the input shaft of the transmission, the four-wheel drive system comprising:

a first spline member being rotatable about a first rotational axis, said first spline member beng driven by the output shaft of the transmission, said first spline member having a first engagement means and a first part of a disengagement preventing means;

a second spline member being rotatable about the first rotational axis of said first spline member, said second spline member being located next to said first spline member, said second spline member having a second engagement means;

an engagement sleeve member being sildably mounted on said second spline member, said engagement sleeve member having a third engagement means and a second part of the disengagement preventing means, the third engagement means of said engagement sleeve member engaging with the second engagement means of said second spline member, the third engagement means of said engagement sleeve member selectively engaging with the first engagement means of said first spline member, the second part of the disengagement preventing means of said engagement sleeve member selectively engaging with the first part of the disengagement preventing means of said first spline member, said engagement sleeve member being selectively positioned at one of a first spline engagement position and a first spline disengagement position;

a shaft membr being located parallel to the first rotational axis of said first spline member, said shaft member being selectively positioned at one of a first position and a second position, the first position of said shaft member corresponding to the first spline engagement position of said engagement sleeve member, the second position of said shaft member corresponding to the first spline disengagement position of said engagement sleeve member, said shaft member having a first notch and a second notch, a width of the first notch being larger than a width of the second notch;



a locking member being biased toward said shaft member, said locking member being selectively inserted in one of the first and second notches of said shaft member, so that when the shaft member is positioned at the first position the locking member is inserted in the first notch of said shaft member and a space is defined in the longitudinal direction of said shaft member between a side of the locking member and a corresponding side of the first notch, and when the shaft member is positioned at the second position the locking member is inserted in the second notch of said shaft member and two sides of the locking member are in contact with corresponding sides of the second notch; and

a fork member being secured to said shaft member, said fork member having an engagement finger, the engagement finger engaging with said engagement sleeve member, the fork member being selectively positioned according to one of the first and second positions of said shaft member, whereby when the shaft member is positioned at the first position the locking member is inserted in the first notch of said shaft member with the space, the engagement sleeve member is positioned at the first spline engagement

position and the first part of the disengagement preventing means of the first spline member engages with the second part of the disengagement preventing means of the engagement sleeve member, so that even when a torque is applied to the first spline member and a thrust force is exerted on the engagement sleeve member, the engagement sleeve member, the fork member and the shaft member are displaced within the space defined between the locking member and the first notch of the shaft member without a large amount of friction and without disengagement of the engagement sleeve member.

4,678,056

PART TIME FOUR WHEEL DRIVE VEHICLE WITH ROAD SURFACE CONDITION SENSOR

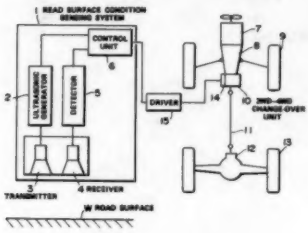
Yuji Kobari, Yokosuka, and Keiichi Miyamoto, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Oct. 3, 1985, Ser. No. 783,562

Claims priority, application Japan, Oct. 9, 1984, 59-151700[U]

Int. Cl.⁴ B62D *1/24*; B60F *17/34*

U.S. Cl. 180—247 **6 Claims**



1. A vehicle comprising:

an engine,

first and second pairs of wheels

a four wheel drive system for transmitting power from said engine to said first and second pairs of wheels, said drive system comprising change-over means for selectively changing said drive system from a four wheel drive mode in which power is transmitted to all of said first and second pairs of wheels to a two wheel drive mode in which power is transmitted only to said first pair of wheels, and vice versa,

road surface condition sensing means for transmitting ultrasonic waves toward a road surface, receiving ultrasonic waves reflected back from the road surface and delivering an output signal when an intensity of the reflected ultrasonic waves is equal to or lower than a predetermined value, and

an actuator means for actuating said change-over means to change said drive system from the two wheel drive mode to the four wheel drive mode when the output signal is produced by said road surface condition sensing means independent of the slip of the wheels of the first pair.

4,678,057

BREATH ALCOHOL ANALYZER

Brian P. Elfman, Alameda, and Patricia L. Zajac, Richmond, both of Calif., assignors to Autosense Corporation, Hayward, Calif.

Filed Jan. 16, 1986, Ser. No. 819,514

Int. Cl.⁴ B60R *1/00*; G08B *23/00*

U.S. Cl. 180—272 **53 Claims**

1. An apparatus for analyzing a breath sample, comprising:

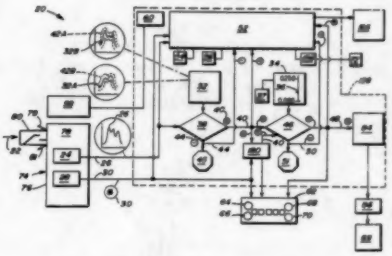
(a) a first means for sensing the pressure, the temperature and the humidity of the breath sample and in response generating a breath signature signal;

(b) a second means for sensing the alcohol content if any of the breath sample and in response generating an alcohol signal;

(c) a third means for providing a breath reference;

(d) a fourth means for providing an alcohol reference which includes an alcohol threshold level;

(e) a fifth means for comparing the breath signature signal with the breath reference and in response generating one of (i) a valid signal if the breath signature signal substantially matches within a pre-selected range the breath reference and (ii) an invalid signal if the breath signature signal does not substantially match the breath reference within the pre-selected range; and



(f) a sixth means for comparing the alcohol signal with the alcohol reference and in response generating one of (i) a passing signal if the alcohol signal is less than the threshold level and (ii) a failing signal if the alcohol signal equals or exceeds the threshold level.

4,678,058

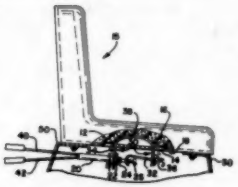
VEHICLE SEAT SWITCH

Eldon W. Wooters, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 7, 1986, Ser. No. 849,128

Int. Cl.⁴ B60K *28/00*

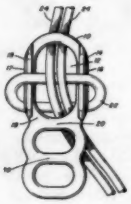
U.S. Cl. 180—273 **5 Claims**



1. An apparatus for selectively interrupting the ignition circuit of an ignition system for a vehicle motor in response to a load being applied to a vehicle operator seat assembly mounted to the vehicle, the seat assembly having a support plate and a cushion means supported by said support plate, said apparatus comprising a switch means, a plunger mounted in said switch means for reciprocal movement along a generally longitudinal axis and adapted to electrically actuate the switch means, a spring means having a first end portion, a second end portion and an arcuate central portion, said first end portion being connected to said second end portion by said arcuate central portion, said arcuate central portion being vertically moveable responsive to the vertical movement of said cushion means, said support plate having a first opening for the passage of said first end portion and a second opening for the passage of said second end portion, the portion of said support plate between said first and second openings being adapted to contact the bottom end portions of said arcuate central portion of spring means and facilitate the flattening of the same in

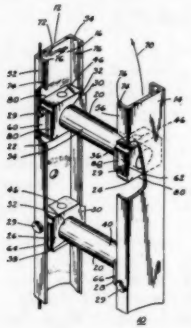
response to vertical movement of the cushion means, said first end portion of said spring means being secured to said switch means, said plunger being connected to said second end portion of said spring means, said second end portion and said plunger being movable in a generally horizontal direction in response to vertical movement of said central portion thereby actuating said switch means between electrically open and closed postions upon the selective application and removal of a load to said seat assembly.

4,678,059
ROPE DESCENDING DEVICE
Thomas K. Bowker, R.F.D. 1, Pine Acres, Rumney, N.H. 03266
Filed May 27, 1986, Ser. No. 867,049
Int. Cl.[4] A63B *29/00*
U.S. Cl. 182—5 **9 Claims**



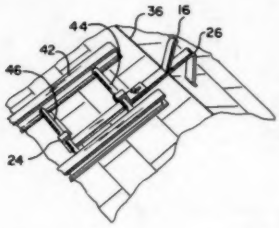
1. A rope descending device, comprising:
an oval ring defining an inner aperture, said ring having a first surface and a second surface, said surfaces lying in substantially parallel planes, a rail attached to the first surface a clasping means for attachment across the width of said ring, and means for connecting the ring to the user of the rope descending device.

4,678,060
COLLAPSIBLE LADDER DEVICE
Joseph A. Pugliese, 94 Elm Ave., Fairview, N.J. 07022
Filed Aug. 25, 1986, Ser. No. 899,637
Int. Cl.[4] E06C *1/383*
U.S. Cl. 182—160 **7 Claims**



1. A collapsible ladder device, comprising:
(a) first and second railing members disposed opposite each other in substantially parallel relationship with each other;
(b) a plurality of rung elements disposed between said railing members in spaced apart relationship, said rung elements having respective first ends disposed adjacent to said first railing member and respective second ends disposed adjacent to said second railing member;
(c) a first set of bracket members disposed at respective ones of said rung element first ends and a second set of bracket members disposed at respective ones of said rung element second ends, said bracket members of said first set being pivotably connected to said first railing member and said bracket members of said second set being pivotably connected to said second railing member; and
(d) pin means for connecting said bracket members to their respective railing members, said pin means being disposed so as to be removed from the central axes of their respective bracket members, whereby said bracket members can act to limit the travel of said railing members when said ladder device is opened for use wherein said side railing members comprise protruberances disposed at their distal edge regions and said bracket members comprise respective detents at their side faces, whereby said protruberances can engage said bracket members at their respective detents when said ladder is open, thereby serving to provide greater rigidity to said ladder device.

4,678,061
LADDER ROOF BRACE
Mark T. Jordan, 368 Shaw St., Braintree, Mass. 02184, and Mark Ferragamo, 18 Oakwood Dr., Randolph, Mass. 02368
Filed Feb. 6, 1986, Ser. No. 826,687
Int. Cl.[4] E06C *5/36, 7/42, 7/48*
U.S. Cl. 182—206 **1 Claim**



1. A ladder hook comprising a base portion, a roof bearing portion and an adjustable, hook element, the base portion comprising a center portion having a first terminal end, a second terminal end and a longitudinal slot, the first terminal end being formed into a first hook portion and the second terminal end being formed into a support portion, the longitudinal slot positioned between the first terminal end and the second terminal end, the hook element formed into a second hook portion and having means of movably engaging the longitudinal slot, the roof bearing portion attached to the second terminal end and extending in a direction opposite to that of the first hook portion, the roof bearing portion and the second terminal end providing a V shaped configuration adapted to engage the roof ridge of a building or the like, said ladder hook further comprising a gutter hook, the gutter hook extending from the center portion of the base portion in angular relation thereto toward the same plane as that toward which the first hook portion extends and positioned between the second terminal end and the longitudinal slot.

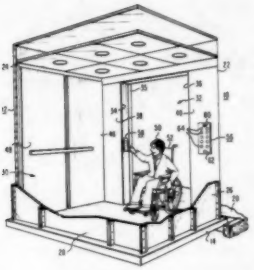
4,678,062
ELEVATOR CAR
Elmer H. Sumka, Edison, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 8, 1986, Ser. No. 849,250
Int. Cl.[4] B66B *9/00*
U.S. Cl. 187—1 R **9 Claims**

1. An elevator car, comprising:
a cab having side, rear and front walls which define an enclosure,
the front wall of said cab defining an opening to said enclosure which includes first and second door jambs,
the front wall of said cab further defining at least one inner

wall portion inside said enclosure which is immediately adjacent to a predetermined one of said first and second door jambs,

door means mounted for sliding motion to open and close the opening to the enclosure,

a first car call panel mounted at a location on said at least one inner wall portion of the front wall selected for convenient use by a passenger on foot,



and a second car call panel mounted at a predetermined location selected for convenient use by a passenger on a wheelchair, notwithstanding a crowded enclosure,

said predetermined location of the second car call panel being on a selected one of the first and second door jambs, such that an elevator call may be registered by a passenger on a wheelchair while still in the opening to the cab enclosure, before the door means closes the enclosure opening, and before the wheelchair passenger is fully within said enclosure.

4,678,063

APPARATUS FOR CONTROLLING AN ELEVATOR

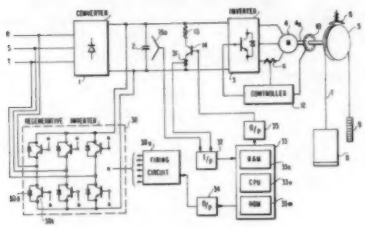
Takashi Kitaoka, and Eiki Watanabe, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,042

Claims priority, application Japan, Oct. 5, 1984, 59-209406

Int. Cl.[4] B66B *1/30*

U.S. Cl. 187—119 **5 Claims**



1. In an elevator controlling apparatus in which an alternating current supplied from a power source is converted into a direct current by a converter, and said direct current is further converted into a variable-voltage and variable-frequency alternating current for controlling a hoist motor,

the improvement comprising:

regenerated power detecting means for producing a first signal when said hoist motor is regenerating electric power;

resistor means, connected to the direct current side of the converter, for consuming the regenerated power in response to said first signal;

consumed power detecting means, coupled to said resistor means, for detecting the amount of the regenerated power being consumed by said resistor means and for producing a second signal when said amount is in excess of a predetermined value; and

regenerative inverter means, actuated in response to said second signal, for returning the excess regenerated power to said power source.

4,678,064

SEALING BOOT FOR USE IN DISC BRAKE ASSEMBLY

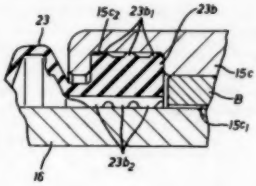
Yoshiharu Adachi, Gamagoori; Fumio Fujimori, Anjo; Toshio Kondo; Hiroshi Uemura, both of Okazaki, and Juichi Shibatani, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed May 24, 1985, Ser. No. 737,484

Claims priority, application Japan, May 25, 1984, 59-077559[U]

Int. Cl.[4] F16D *65/14;* **B61F** *15/22*

U.S. Cl. 188—73.45 **11 Claims**



1. A sealing boot of elastomeric material for use in a disc brake assembly of the pin slide type which includes a stationary support member, a caliper member slidably mounted on said stationary support member, and at least one support pin fixed to one of said stationary support member and said caliper member and being slidably inserted into an axial bore formed in the other of said members for slidable support of said caliper member, said sealing boot being arranged in surrounding relationship with said support pin and including a bellows portion which is integrally formed at opposite ends thereof with an outside cylindrical sealing portion coupled over said support pin and an inside cylindrical sealing portion coupled within an annular groove formed in said other member, the inside cylindrical sealing portion being retainingly disposed between opposed end walls of said annular groove, being formed at its outer circumference with a first annular projection in contact with the bottom surface of said annular groove, and being formed at its inner circumference with a second annular projection in sliding contact with the outer circumference of said support pin to permit sliding movement of the inside cylindrical sealing portion on said support pin,

wherein the second annular projection of said inside cylindrical sealing portion is slightly displaced relative to the first annular projection toward an open end of said axial bore in said other member, wherein the first annular projection of said inside cylindrical sealing portion is formed at one side thereof with a steep annular surface directed toward the open end of said axial bore and at the other side thereof with a gentle slope annular surface and has a rounded annular head in contact with the bottom surface of said annular groove, and wherein said first annular projection is disposed in spaced relation with respect to both of said opposed end walls of said annular groove and in position to be radially expanded by a fluid pressure acting on the steep annular surface thereof.

5. A sealing boot of elastomeric material for use in a disc brake assembly of the pin slide type which includes a stationary support member having at least one support pin fixed thereto, and a caliper member having a boss portion axially slidably supported on said support pin, said sealing boot being arranged

in surrounding relationship with said support pin and including a bellows portion which is integrally formed at opposite ends thereof with an outside cylindrical sealing portion coupled over said support pin and an inside cylindrical sealing portion coupled within an annular groove in the boss portion of said caliper member, the inside cylindrical sealing portion being retainingly disposed between opposed end walls of said annular groove, being formed at its outer circumference with a first annular projection in contact with the bottom surface of said annular groove, and being formed at its inner circumference with a second annular projection in sliding contact with the outer circumference of said support pin to permit sliding movement of the inside cylindrical sealing portion on said support pin,

wherein the second annular projection of said inside cylindrical sealing portion is slightly displaced relative to the first annular projection toward the exterior, wherein the first annular projection of said inside cylindrical sealing portion is formed at one side thereof with a steep annular surface directed outwardly and at the other side thereof with a gentle slope annular surface and has a rounded annular head in contact with the bottom surface of said annular groove, and wherein said first annular projection is disposed in spaced relation with respect to both of said opposed end walls of said annular groove and in position to be radially expanded by a fluid pressure acting on the steep annular surface thereof.

4,678,065

BRAKE ACTUATOR

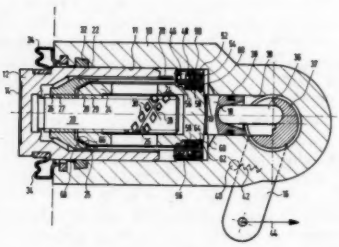
Ralf Erben, Koblenz, and Michael F. M. Walden, Andernach-Eich, both of Fed. Rep. of Germany, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Nov. 19, 1985, Ser. No. 799,576

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 8434025[U]

Int. Cl.[4] F16D *55/16*; B60T *7/00*

U.S. Cl. 188—196 D **7 Claims**



1. A brake actuator, comprising a cylinder casing (**10**) in which an hydraulically operable piston (**12**) and a mechanically operable tappet (**18**) are guided between which there is arranged an adjustment device for transmitting a mechanical actuating force and including a spindle (**20**) and two different screw thread pairs (**26, 27; 28, 29**) each being of non-self-locking type, and a coupling (**25**) being engaged upon actuation of the tappet to prevent relative rotation of the screw threads of ech pair characterized in that two threads (**26, 28**) are formed on said spindle, said threads (**26, 28**) intersecting over a co-extensive part of the length of the spindle (**20**), in that both an adjusting nut (**24**) and a collet (**22**) are threaded on said intersecting threads (**26, 28**), and in that the coupling (**25**) is formed by a friction surface between said adjusting nut (**24**) and said collet (**22**).

4,678,066

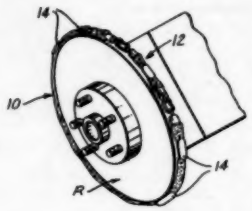
VIBRATION DAMPENER

Robert J. Heintz, Box 891, Royal Oak, Mich. 48068

Filed Aug. 29, 1985, Ser. No. 770,765

Int. Cl.[4] F16F *15/12*

U.S. Cl. 188—218 A **3 Claims**



1. A vibration dampener for dampening vibration in a brake rotor during resurfacing, comprising a first elongated flexible and stretchable member, a second elongated flexible and stretchable member which is shorter than the first, weights carried by said members, and means for connecting said members together end-to-end in a closed loop capable of being stretched over the periphery of a relatively large diameter brake rotor, said connecting means being releasable so that said second member may be removed and the ends of said first member connected together in a closed loop capable of being stretched over the periphery of a smaller diameter brake rotor, said members being tubular and said connecting means comprising a connector assembly for each end portion of each member, each connector assembly comprising a cap sleeved on an end portion, and an eye-bolt having a eye outside said end portion and a shank extending into said end portion beyond said cap to a point where it has an enlargement of sufficient diameter to radially stretch said end portion, said cap having an inside diameter smaller than said enlargement and cooperating with said enlargement to prevent said eye-bolt from pulling out of said end portion.

4,678,067

INTERNAL SHOE-DRUM BRAKE

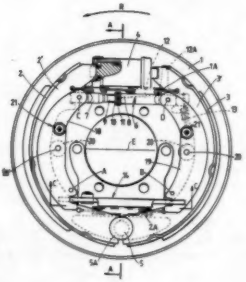
Richard E. Thompson, Gwent, United Kingdom, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 29, 1985, Ser. No. 759,904

Claims priority, application United Kingdom, Aug. 9, 1984, 8420228

Int. Cl.[4] F16D *51/48, 65/14*

U.S. Cl. 188—328 **19 Claims**



1. An internal shoe drum brake comprising:

a pair of arcuate brake shoes mounted on a backplate;

a first actuator disposed between one pair of adjacent shoe

end portions and operable to expand the shoes into braking engagement with a brake drum for service operation;

a strut having one end and extending between the shoes at a location adjacent said one pair of adjacent shoe end portions;

an abutment device disposed between and normally engaged by the other pair of adjacent shoe end portions;

a mechanical second actuator disposed adjacent to said abutment device;

a lever arm having one end adjacent one of said brake shoes and engaged adjacent said one end of said lever arm with said one end of said strut, and an opposite end adjacent said abutment device, said lever arm being operatively associated with said mechanical second actuator; and

force transmission means supported on said lever arm in a position to engage said one brake shoe at an intermediate location between said one end of said lever arm and the end of said one brake shoe adjacent said abutment device;

so that operation of said mechanical second actuator causes said lever arm to pivot about the engagement thereof with said strut and more outwardly with respect to the brake axis and thereby apply an actuating force to said one brake shoe by said force transmission means at said intermediate location for initiating duo-servo operation of the brake via said strut upon contact of said one brake shoe with the drum.

4,678,068

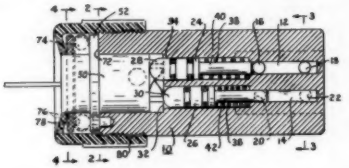
AUTOMOBILE BRAKE LOCKING SYSTEM

Thomas A. Matthews, 4824 Atlantic Ct., Apartment 6, Cape Coral, Fla. 33904; Walter Fischer, P.O. Box 782713, Sandton, Johannesburg, South Africa 2146, and Lucas Petzwinkler, P.O. Box 34248, Erasmie 0023, South Africa

Filed Aug. 19, 1985, Ser. No. 766,489

Int. Cl.[4] B60R *25/08;* **B60T** *17/16*

U.S. Cl. 188—353 **1 Claim**



1. In a vehicle having front and rear wheels, hydraulically operated brake cylinders at said front and rear wheels, a foot-operated pedal to apply said front and rear brake cylinders by a tandem master cylinder situated between the foot-operated pedal and the brake cylinders, the master cylinder including separate outlet ports, a key-operated control mechanism including a key, the mechanism being separate from said master cylinder, the mechanism further being interposed between the master cylinder and said front and rear brake cylinders, said mechanism including a cylindrical barrel with two parallel compound diametered cylinders each having smaller and larger longitudinally extending bores, longitudinally spaced front and rear apertures or ports in each of said smaller bores, compound plunger assemblies with each assembly including a rounded end, an intermediate plunger and a plunger projection of smaller diameter than the respective plunger, the assemblies slidably mounted in said two diametered cylinders, an hydraulic fluid conduit interconnecting one of said front ports with said front brake cylinders and an hydraulic conduit interconnecting the other front port with said rear brake cylinders, separate hydraulic fluid conduits interconnecting the rear ports separately with said master cylinder outlet ports, each of said smaller-diametered plunger projections each being operable in one position by operation of the key-operated control mechanism to cause longitudinal movement of the plungers and associated projections to overlie and close the front ports and operable in the key-operated mechanism's inoperative position to open the front ports, a separate coil spring surrounding each of the smaller diametered plunger projections and operable to urge the plunger projections to move to uncover the front ports in the smaller diametered bores in said inoperative position to provide open fluid communication between the front and rear ports, the rounded ends of each plunger assembly being integral with the said intermediate plungers with the rounded ends projecting beyond the larger diametered bores toward key operated cam members of said mechanism to engage the rounded ends of the larger diametered plungers to longitudinally move the smaller diametered plunger projections to close the front ports of the smaller diametered bores to trap fluid in the front and rear brake cylinders to lock the vehicle wheels against rotation, the locking mechanism being of the double-acting cam type, rotation of the key inducing cam surfaces of the double-acting cam to rotate relative to the rounded ends of said plungers to cause the shifting of said plunger assemblies by direct engagement between the cam surfaces and rounded ends of the respective plunger assembly.

4,678,069

CLUTCH CONTROL SYSTEM WITH VARIABLE CLUTCH CONNECTION POSITION

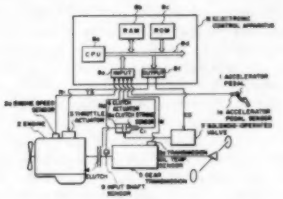
Hiroshi Yoshimura, Yokohama, and Toshihiro Hattori, Ayase, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,370

Claims priority, application Japan, Feb. 28, 1985, 60-39375

Int. Cl.[4] F16D *66/00*

U.S. Cl. 192—0.033 **16 Claims**



1. A clutch control system for controlling a clutch to transmit and cut off rotation from an automobile engine to wheels of the automobile, said clutch control system comprising:

a gear transmission, having lubricating oil, for changing the speed of the transmitted rotation from the automobile engine;

a clutch, coupled between the automobile engine and said gear transmission, for transmitting rotation from the automobile engine to said gear transmission;

a clutch actuator, coupled to said clutch, for operating said clutch between a connected position and a disconnected position with respect to the automobile engine;

means for learning and storing a learned value corresponding to a position at which to start connecting said clutch;

means, coupled to said gear transmission, for detecting the temperature of the lubricating oil of said gear transmission;

means for storing a corrective clutch control value corresponding to the detected temperature of the lubricating oil; and

means, coupled to said learning means and said storing means, for correcting the learned value by the corrective clutch control value derived from the detected temperature of the lubricating oil to provide a new learned value.

4,678,070

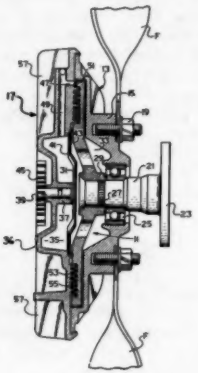
FLUID COUPLING DEVICE HAVING IMPROVED HEAT DISSIPATION

Gerard M. Light, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 725,683, Apr. 22, 1985, abandoned. This application May 5, 1986, Ser. No. 861,651

Int. Cl.[4] F16D *27/02, 13/72*

U.S. Cl. 192—58 B 22 Claims



1. A rotary coupling device of the type including a first rotatable coupling assembly comprising a housing member and a cover member cooperating to define a coupling chamber therebetween, a second rotatable coupling member disposed in said coupling chamber and being rotatable relative to said first rotatable coupling assembly, the forward surface of said second coupling member and an adjacent surface of said cover member cooperating to define a torque-transmitting region therebetween, control means operable to control the amount of torque transmission between said first rotatable coupling assembly and said second rotatable coupling member in response to variations in a predetermined condition, said rotary coupling device being of the type in which the torque-transmitting capability of said coupling device is limited at least in part by the ability of said coupling device to dissipate heat generated as a result of said torque transmission, said cover member including a plurality of cooling fins disposed on the forward surface of said cover member and being operable to dissipate heat transmitted from said torque-transmitting region by said cover member; characterized by:

(a) said plurality of cooling fins being arranged in a plurality of groups of cooling fins; and

(b) each of said groups of said cooling fins comprising one cooling fin oriented generally radially, the remainder of said cooling fins in each group being oriented substantially parallel to said one radially-oriented cooling fin, over at least a major portion of the length thereof, thereby to increase substantially the total possible fin length within a given finned area, and the resulting heat dissipation.

4,678,071

DIAPHRAGM SPRING CLUTCH COVER ASSEMBLY

Robert J. Ball, Bishops Itchington, and Ian C. Maycock, Leamington Spa, both of England, assignors to Automotive Products plc, Leamington Spa, England

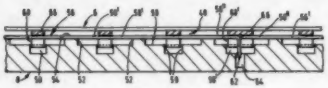
Filed Jun. 23, 1986, Ser. No. 877,354

Claims priority, application United Kingdom, Jul. 10, 1985, 8517470; Feb. 27, 1986, 8604874

Int. Cl.[4] F16D *13/50*

U.S. Cl. 192—70.27 19 Claims

1. A diaphragm spring clutch cover assembly comprising a pressure plate, a cover, a diaphragm spring for loading the pressure plate, a first annular fulcrum arrangement to one side of the diaphragm spring and provided on the pressure plate, a second annular fulcrum arrangement to the opposite side of said diaphragm spring and provided on the cover, and the diaphragm spring acting between the fulcrum arrangements, at least one of the fulcrum arrangements comprising cushioning means comprising a resilient fulcrum ring, an annular array of spaced supporting means supporting the ring about the axis of the diaphragm springs, portions of the ring each spanning a



respective space between adjacent said supporting means, elements astride the ring at spaced locations around the ring, each element being at a respective said portion, and each said element providing a distance piece proud of the ring, and the distance pieces being urgeable by the diaphragm spring for the resilient deformation of said respective portions axially of the ring in their respective spaces during movement relative to the cover of the diaphragm spring for the latter to apply increasing loading on the pressure plate.

4,678,072

BILL VALIDATING AND ACCUMULATING DEVICE

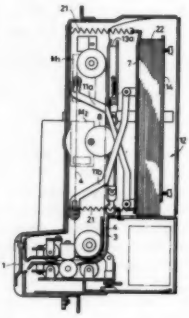
Osamu Kobayashi; Masaki Akagawa, and Hiroshi Hayashi, all of Saitama, Japan, assignors to Nippon Coinco Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,585

Claims priority, application Japan, Oct. 3, 1983, 58-184848

Int. Cl.[4] G07F *7/04*

U.S. Cl. 194—206 7 Claims



2. A bill validator, comprising:

a vertically elongated casing,

a bill insertion slot on the lower front of said casing,

validation sensors, means within said casing for conveying an inserted bill rearwardly and upwardly past said validation sensors,

an accumulation box forming part of the mid and upper rear of said casing, said accumulation box including a rear channel shaped portion, said channel spaced portion being rotatable backward to permit removal therefrom of an accumulated stack of bills, and

push plate means within said casing for translating a true validated bill, after upward conveyance, rearwardly into said accumulator box.

4,678,073

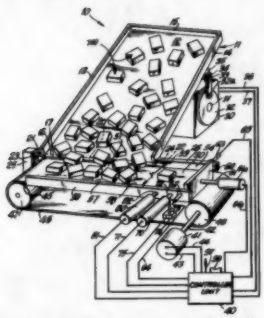
APPARATUS AND METHODS FOR HANDLING BULK ARRAYS OF ARTICLES

Carl R. Anderson, Arvada, and Gary G. Seaman, Broomfield, both of Colo., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Murray Hill, N.J.

Filed Apr. 4, 1985, Ser. No. 719,934

Int. Cl.[4] B65G *47/19, 47/20*

U.S. Cl. 198—396 **3 Claims**



1. Apparatus for handling bulk array of articles comprising: an upwardly facing hopper tray for receiving said array, said tray having at it front a discharge opening the bottom of which is defined by an edge of said tray, an elongated horizontal conveyer disposed outward of, and tangential on its inner side with, said edge and extending alongside said opening and beyond it to a zone spaced from said opening, motor means for moving said conveyer forward past said opening into said zone, an abutment opposite said edge at the outer side of said conveyer for retaining articles thereon, tray tilting means for displacing said tray's rear up and down relative to its front so as to move said tray between down and up angular positions at which articles on said tray will, respectively, remain on it and slide off it onto said conveyer for transport thereby of said articles to said zone, the tilting of said tray down being adatped to relieve pressure on articles forced on such conveyer against said abutment by articles still on said tray, article sensing means disposed along said conveyer between said opening and the end away from said opening of said zone and adapted to produce signals in response to passage by said sensing means of articles carried by said conveyer from said opening to said zone, jamming of articles on said conveyer resulting in said articles not passing by said sensing means, and a control unit coupled to receive said signals and operable after nonproduction of said signals for a period of time to reversely energize said motor means so as to impart a temporary reverse movement of said conveyer tending to relieve said jamming.

4,678,074

APPARATUS FOR SEPARATING OBJECTS (PACKAGES) FROM A CONTINUOUS ROW OF OBJECTS

Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke and Co., Fed. Rep. of Germany

Continuation of Ser. No. 515,420, Jul. 20, 1983, abandoned. This application Jan. 15, 1986, Ser. No. 818,917

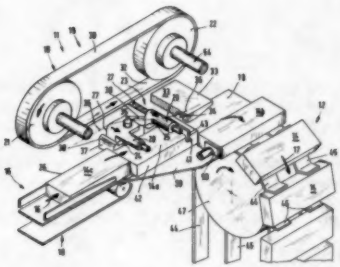
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 3230533

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—457 **18 Claims**

1. In an apparatus for separating front objects one at a time from a row of objects fed in a densely packed row of end-to-end abutting objects, particularly packages such as cigarette cartons, by transversely pushing away at least the front object of said row, one at a time, said apparatus comprising: a feed conveyor bearing said row of objects, a transverse pusher conveyor moving generally parallel to said feed conveyor bearing said row of objects, transverse pushers provided on said transverse pusher conveyor which grasp an object laterally and, as the conveying continues, push it away, transverse to the feed conveying direction of said objects, the improvement comprising:

means for moving said transverse pushers (**23, 56**) relative to said feed conveyor (**10**) at a speed lower than the speed of movement of said feed conveyor (**10**) and means for moving said transverse pushers (**23, 56**) lengthwise along an



essentially linear conveying path transverse to the feed conveying direction (**16**) at least during the pusher motion.

a discharge covenyor (**12**) mounted laterally to one side of the feed conveyor (**10**) on the discharge side of the transverse pushers (**23, 56**) and in the path of movement of the objects leaving the feed conveyor (**10**), and

a stop (**49**) provided on the discharge conveyor (**12**) to the side remote from said feed conveyor and said transverse pushers for limiting the movement of objects (**14**) in their longitudinal direction of movement onto said discharge conveyor.

4,678,075

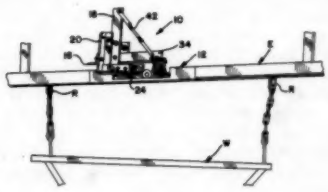
OVERHEAD CONVEYOR CLEANING APPARATUS

John H. Bowman, Jr., 9723 S. Meade, Oak Lawn, Ill. 60453

Filed Jan. 16, 1986, Ser. No. 819,793

Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—496 **14 Claims**



1. An apparatus for cleaning an overhead conveyor system including a suspended guide rail and a conveyor movable along said rail, said apparatus comprising:

a main support structure configured for fixed mounting on an upper surface of said guide rail;

at least one generally elongated support arm pivotally mounted on said main support structure by fulcrum means and including a free end portion;

wire brush means mounted on each said support arm at the free end portion thereof, said brush means comprising a plurality of juxtaposed wire elements engageable with said conveyor as said conveyor moves relative to said guide rail and said brush means; and

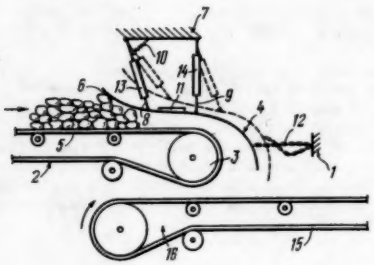
threaded adjustment means connected to and extending between said main support structure and each said support arm, said threaded adjustment means being selectively adjustable to move said support arm about said fulcrum means to vary the pressure exerted on said conveyor by said wire brush means, whereby said brush means effects continuous cleaning of debris from said conveyor.

4,678,076

TRANSFER ASSEMBLY OF BELT CONVEYOR

Sergei S. Nenakhov; Robert S. Tilles, both of Moscow; Vitaly V. Savinykh, Moskovskoi; Vladimir A. Dyakov, and Vladimir V. Nikitin, both of Moscow, all of U.S.S.R., assignors to Vsesojuzny Institut Po Proektirovaniju Organizatsii Energeticheskogo Stroitelstva, Moscow, U.S.S.R.

Filed Oct. 15, 1985, Ser. No. 787,430
Claims priority, application U.S.S.R., Oct. 24, 1984, 3806901
Int. Cl.[4] B65G 47/19
U.S. Cl. 198—525 4 Claims



1. A transfer assembly of a conveyor belt extending in a longitudinal direction, comprising:

a rigid frame means;

a discharge end of the conveyor;

a discharge drum of the conveyor, said discharge drum being rigidly secured to said frame means at said discharge end of the conveyor;

a deflector shield means hinged to said frame means on said discharge end of the conveyor, said deflector shield means having a curvilinear portion whose concavity faces said discharge drum and is located after said discharge drum along the conveyor belt travel;

said deflector shield means having an entry portion located before said discharge drum upstream along the conveyor belt;

a support means rigidly secured to said frame means at said discharge end of the conveyor;

at least two rods spaced from each other in said longitudinal direction and downstream with respect to the conveyor belt, and each hinged at one end to said deflector shield means and at an opposite end to said support means in order to ensure hinged suspension of said shield means from said frame means; and

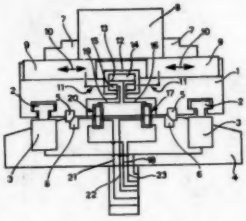
said rods being connected to said support means and said deflector shield means so that said entry portion of said deflector shield means rises faster than said curvilinear portion in response to the transporting of large pieces of transported material on said conveyor.

4,678,077

SYSTEM FOR CONTROLLING THE JAWS OF A SELF-CENTERING PLATFORM (PALLET) WHICH CAN BE MOVED BETWEEN FITTINGS (PALLET SUPPORTS) CARRIED BY THE LOADING AND UNLOADING STATION AND THE WORKING STATION OF A MACHINE TOOL

Mario Bertorello, Turin, Italy, assignor to Rotomors S.p.A, Turin, Italy

Filed Feb. 19, 1985, Ser. No. 702,468
Claims priority, application Italy, Dec. 7, 1984, 54134 8/84
Int. Cl.[4] B23Q 3/00
U.S. Cl. 198—803.01 6 Claims



1. In a machine tool of the type having a loading and unloading station, a working station, respective pallet supports at said stations, and a self-centering pallet provided with jaws and movable between said pallet supports, a system for controlling the jaws of said pallet including a double-acting hydraulic cylinder incorporated in the pallet to control the movements of said jaws, a pair of supply and discharge ducts connected to said cylinder, and a hydraulic control circuit outside the pallet having a pair of ducts communicating with said supply and discharge ducts,

wherein the improvements consist in said ducts of the external hydraulic control circuit being formed in the pallet support of one of said stations, and each of said ducts communicating with one of the supply and discharge ducts through a respective connecting device including:

interengageable connectors mounted in correspondence with the mutually-facing surfaces of said pallet and said pallet support, the connector projecting from the pallet support being movable axially;

a pallet support valve which is connected to the connector on said pallet support and is held open against a resilient force when said connector on said pallet support is engaged in the connector projecting from said pallet during the superpositioning of said pallet on said pallet support;

a non-return valve recessed in the connector projecting from said pallet;

a rod passing through the connector projecting from said pallet support and able to advance and open the non-return valve independently of the pallet support valve; and

a piston connected to said rod to effect the advance of the rod upon the application of a pilot pressure to the piston.

4,678,078

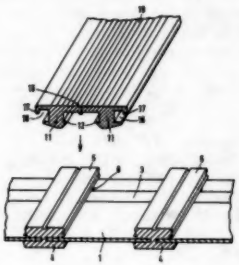
SLAT CONVEYOR BELT FOR SLAT CONVEYOR

Hugo S. Hastem-Müller, Oettinger Strasse 9, D-8860 Nördlingen, Fed. Rep. of Germany

Filed Dec. 4, 1985, Ser. No. 804,811
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1984, 3445125
Int. Cl.[4] B65G 47/84
U.S. Cl. 198—803.2 12 Claims

1. In a flat conveyor belt for slat conveyors having a plurality of endless belts operationally arranged in parallel spaced relationship, transverse equally spaced transport ribs secured

to the inner surface of said belts, said ribs being operationally engageable by complementary grooves in at least one driven transport roller, and transverse rest elements integral with said transport ribs and projecting through holes in said belts to the outer surface of said belts, slat positioning means on said rest elements comprising rest ribs having side rest grooves extending over the entire transverse length thereof and providing outer rest lugs, elongated slats cooperable with said positioning



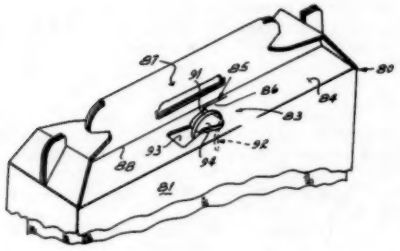
means comprising a pair of spaced longitudinal crosspieces depending from the bottom surface thereof, a longitudinal projection, on each of said crosspieces to provide a pair of opposed projections, said crosspieces and projections being arranged and dimensioned so that the slats are fittable over the rest lugs from above said rest grooves, and a plurality of sharp raised parts integral on said slats or said rest ribs which when operationally press-fitted engage the associated opposed part to secure the slat against longitudinal movement.

4,678,079

CONTAINER FOR HANGER-SUPPORTED GARMENTS

John C. Henning, Fairfield, Ohio, assignor to Product Investment Incorporated, Cincinnati, Ohio

Filed May 15, 1986, Ser. No. 863,462
Int. Cl.[4] B65D *85/18*
U.S. Cl. 206—279 **16 Claims**



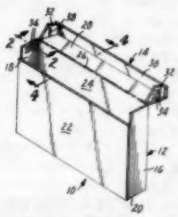
1. In a paper-board container for transporting articles supported from a hanger, said container comprising a top wall and handle means associated with the top wall, the improvement comprising a hanger-support structure found in said top wall and comprising a slot having an elongated leg and a transverse leg extending at an angle to said elongated leg, a flap in the top wall adjacent said slot, and an opening in said top wall disposed on the side of said flap remote from said slot, the slot being adapted to receive the hook of said hanger, the flap being foldable under said hook and the opening being adapted to receive the end of said hook.

4,678,080

VIDEOCASSETTE SLEEVE AND COVER

Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 3, 1985, Ser. No. 804,060
Int. Cl.[4] B65D *85/672, 43/14*
U.S. Cl. 206—387 **1 Claim**



1. A closed, molded box for storing a videocassette or like object, comprising:

an open sleeve adapted to accept a said videocassette, said sleeve having rectangularly disposed first and second end walls, a first edge wall and two opposed side walls;

a cover movable to a closed position wherein said cover defines a second edge wall of said sleeve;

a living hinge connecting one of said sidewalls of said sleeve and said cover, said hinge, said sleeve and said cover being molded simultaneously and integrally;

locking walls extending perpendicular to said cover and disposed within, adjacent and parallel to each of said sleeve end walls when said cover is in said closed position;

mating projections including at least one raised ridge on at least one of said locking walls projecting toward said locking wall's adjacent end wall and at least one raised detent projecting from at least one of said end walls toward said end wall's adjacent locking wall, said raised ridge and said raised detent being disposed so that said raised ridge must be forced past said raised detent when said cover is moved to said closed position; and

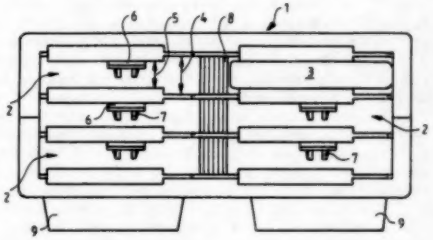
a videocassette-positioning protrusion projecting toward the other of said locking walls and adapted to contact a said videocassette within said sleeve when said cover is in said closed position, so that said videocassette will force said locking wall raised ridge and said end wall raised detent into engagement.

4,678,081

MAGAZINE FOR RECORDING TAPE CASSETTES

Herbert Richter, Pforzheim-Bue, Fed. Rep. of Germany, assignor to Herbert Richter, Metallwaren-Apparatebau GmbH & Co., Pforzheim-Bue, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,603
Claims priority, application European Pat. Off., Sep. 11, 1985, 85111504.8
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—387 **11 Claims**



1. A magazine for recording tape cassettes especially for use in vehicles, comprising a housing having a number of cham-

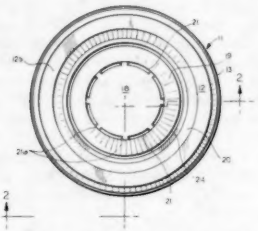
bers, each for the reception of one cassette, each said chamber having an opening of a cross-section corresponding to the smaller cross-section of a tape cassette and adapted to receive such cassette lengthwise; said chambers being arranged horizontally and formed by drawer-like building elements stacked on top of one another and compressed within said cassette housing, one being disposed on top of each chamber, each of said building elements having at least one spring leaf cantilevered from each building element so as to extend essentially in the direction of movement of a cassette into, and out of, said chamber, said spring leaf having a free end movable relative to said chamber; a locking member supported at the free end of each spring leaf so as to project downwardly into said chamber for engagement with the hub opening of at least one of a tape cassette's reel hub openings, said locking member including a cam-like rib projection oriented also in the direction of movement of a cassette into, and out of, said chamber, said cam-like rib having cam-like edges adapted to cause the locking member to resiliently back up when a cassette portion is moved past them, each of said building elements having downwardly projecting side walls at opposite sides of said chambers with resilient guide straps disposed at one side thereof and projecting into said chamber and engaging herein any cassette inserted into said chamber so as to force said cassette into engagement also with the opposite wall of said chamber.

4,678,082

VACUUM INDICATING THERMOPLASTIC CLOSURE

William E. Fillmore, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 10, 1986, Ser. No. 884,244
Int. Cl.[4] B65D *41/04*
U.S. Cl. 206—459 **16 Claims**



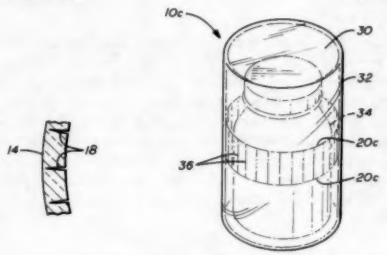
1. In combination with a container containing a vacuum-packed product therein and having a finish portion for receiving a closure to close and seal said container, a closure sealingly engaging the finish portion of said container, said closure comprising, in combination: a top portion spanning the finish of the container; and an annular skirt extending downwardly from the top portion over the upper portion of the finish and securely engaging said finish, said top portion being formed from a thermoplastic material and comprising a generally planar circular inner portion, said top portion further having an inside which faces toward said vacuum-packed product and an outside which faces away from said vacuum-packed product, a first annular portion surrounding said circular inner portion, said closure top portion being thinned on said outside along a first interrupted generally circular line between said circular inner portion and said first annular portion to form a first plurality of narrow, spaced apart bridges along said first interrupted generally circular line, and a second annular portion surrounding said first annular portion, said closure top portion, further, being thinned on the inside along a second interrupted generally circular line between said first annular portion and said second annular portion to form a second plurality of narrow, spaced apart bridges along said second interrupted generally circular line, said circular inner portion, said first annular portion and said second annular portion being integrally formed in one piece with said circular inner portion being hinged to said first annular portion along said first interrupted generally circular line and said first annular portion being hinged to said second annular portion along said second interrupted generally circular line, the plane of said circular inner portion being movable with respect to the plane of said second annular portion from a first position when there is a vacuum in said container to a second position when there has been a loss of the desired vacuum in said container, with the second position being higher in elevation than the first position when the container is in its normal upright position, said first plurality of narrow, spaced apart bridges and said second plurality of narrow spaced apart bridges being in compression when said circular inner portion is in said first position to assist in moving said circular inner portion to said second position upon said loss of the desired vacuum in said container.

4,678,083

INTRUSION INDICATING SHIELD FOR CONSUMER PRODUCTS

David H. Anderson, 13002 Breezeway, Houston, Tex. 77037

Filed Jul. 29, 1986, Ser. No. 891,454
Int. Cl.[4] B65D *41/32*
U.S. Cl. 206—459 **9 Claims**



1. An intrusion indicating shield for consumer products in a container having an opening comprising,

a body enclosing the opening to the container,

said body having at least one elongate perforation on the inside of the body extending outwardly from the interior of the body towards but spaced from the exterior of the body,

gripping means on the exterior of the body for manually breaking the body along the perforations for providing access to the container,

said body being of a semi-rigid plastic material which discolors when damaged for providing a visual indication of tampering.

4,678,084

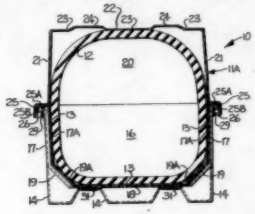
SHIPPING CONTAINER FOR PACKAGING ENDLESS BELTS FOR TRANSPORTATION OR STORAGE

Lewis W. Maker, Charlotte, N.C., and Horace Nicholson, Mullins, S.C., assignors to United States Supply Company, Charlotte, N.C.

Filed Dec. 17, 1985, Ser. No. 810,055
Int. Cl.[4] B65D *19/00*
U.S. Cl. 206—597 **31 Claims**

1. A generally rectangularly shaped container for facilitating the shipment, storage and removal of heavy, bulky and deformable endless belts of a generally cylindrical configuration and of a type used in the textile industry for shrinking fabrics, said container comprising top and bottom members cooperatively engaging each other to form a hollow closed chamber, said top and bottom members each being integrally molded of relatively thick plastic material, said top member comprising opposing pairs of side and end walls and a top wall, said bottom member comprising opposing pairs of side and end walls, a bottom wall, and interposed wall portions extending at an

angle between said bottom and side walls and interconnecting the same, said interposed wall portions being adapted to serve for preventing deformation of a belt by providing stabilizing underlying support for the belt portions resting thereon and belt portions extending upwardly therefrom for maintaining the generally cylindrical configuration of the belt so as to prevent the formation of creases in the belt, and a plurality of



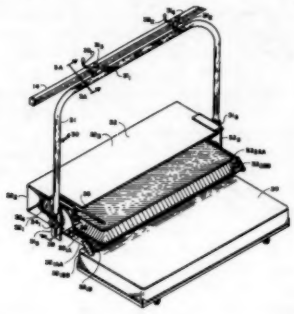
spaced apart projecting members extending downwardly from said bottom wall, said interposed wall portions and said adjacent side walls, said projecting members defining supporting feet for the container, and wherein said projecting members are arranged so as to define forklift channels therebetween adapted to receive the forks of a forklift truck for facilitating the lifting and transporting of the container.

4,678,085

APPARATUS FOR THE DISPLAY AND STORAGE OF MATTRESSES

Daniel D. Sando, 11888 Longridge Dr., Baton Rouge, La. 70816

Filed Sep. 5, 1986, Ser. No. 903,706
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—28 **20 Claims**



1. Apparatus for the display and storage of mattresses which, in combination, comprises

a housing, inclusive of floor frame, supports and ceiling frame, providing mattress display and storage areas,

a plurality of overhead tracks mounted upon and supported by the ceiling frame of said housing, each track being independently mounted and parallel one track with respect to another,

a plurality of mattress display and storage carriages corresponding in number to the number of tracks, each being suspended from and independently mounted on a track such that mattresses contained within said mattress display and storage carriages can be stored in tandem within said storage area, and independently transported upon the track from which it is suspended and mounted to said display area, and

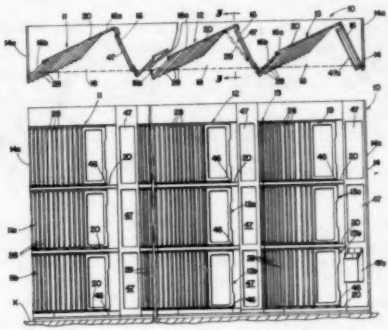
a box spring located within the display area, the box spring being movable about the floor of the display area for receipt of mattresses from the mattress display and storage carriages.

4,678,086

PAGE TYPE DISPLAY FIXTURE WITH SELF RETURN FEATURE

Charles H. Nervig, Berea, and Vance E. Dimmick, Strongsville, both of Ohio, assignors to American Greeting Corporation, Cleveland, Ohio

Filed Oct. 1, 1984, Ser. No. 656,354
Int. Cl.[4] A47F 7/16
U.S. Cl. 211—47 **19 Claims**



1. A display fixture comprising a base frame, a series of generally side-by-side swingable page members, each having means thereon for supporting an article for display purposes, each of said page members being pivotally mounted for swinging movement on said base frame in a generally horizontal plane and with respect to respective gnerally vertically spaced pivots on said base frame, the lower one of each pair of said pivots having self return means for causing each said page member to automatically move by gravity into a predetermined reposed position with respect to said base frame and with respect to the adjacent page members, said reposed position being one wherein the respective page member is disposed at a predetermined acute angle with respect to a generally vertical plane passing through said lower pivots of said series of page members, and wherein said self return means comprises a generally forizontal base section and a pair of inclined, generally helical upwardly extending camming surfaces coacting with each said lower pivot in generally surrounding relation with the respective lower pivot, and the respective of said page members includes a rider section spaced from the pivotal axis of the page member and which is adapted for camming engagement with one of the respective said pair of camming surfaces whereby said respective page member is urged into aid predetermined reposed position with respect to said base frame and with respect to the other page members of said series, said surfaces at their lower ends commencing at said base section in generally equal laterally spaced relation to said vertical plane and curving smoothly upwardly from said base section and in the general direction of said vertical plane, whereby when each of said page members are automatically urged to said reposed position, said rider section of the respective page member is disposed at said lower end of the respective said one surface, said self return means being utilizable for either right hand or left hand orientation of a respective series of said page members.

4,678,087

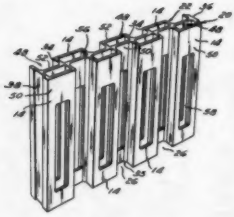
MODULAR SKI RACK

Randall A. York, 16791 Summer Cloud La., Huntington Beach, Calif. 92646

Filed Feb. 21, 1985, Ser. No. 704,770
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—70.5 **19 Claims**

1. A ski rack comprising a plurality of vertically elongated

pockets in which the tail end of a pair of skis can be supported, said pockets having an open top through which the skis are introduced and removed, said pockets being aligned to form a substantially linear rack with a front row and rear row of pockets which are substantially parallel, the pockets forming the front row of the rack being spaced from each other and the



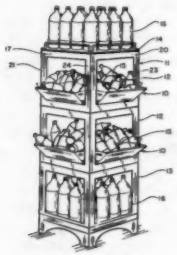
pockets forming the rear row of the rack also being spaced, but staggered relative to the front pockets so that where there is a space between front pockets, there is a rear pocket, and vice versa, the width of the spaces between adjacent pockets in a row being less than the width of one of said adjacent pockets, enabling close, edge to edge packing of skis within a short linear space, without entanglement of the ski bindings.

4,678,088

COLLAPSIBLE DISPLAY AND STORAGE CONTAINER

Paul Flum, Ladue, Mo., assignor to Paul Flum Ideas, Inc., St. Louis, Mo.

Filed Apr. 28, 1986, Ser. No. 856,284
Int. Cl.[4] A47B *47/06*
U.S. Cl. 211—73 **30 Claims**



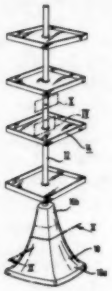
1. A collapsible display container comprising a sheet of material having top and bottom surfaces and a plurality of side edges, said sheet including means for weakening said sheet along a portion thereof, said weakening means being positioned at an intermediate location spaced from said plurality of side edges and defining a central panel portion within said sheet, portions of said sheet located between said weakening means and said plurality of side edges defining a plurality of side panels, each of said side panels being movable about said weakening means in at least one direction relative to said central panel portion, and a plurality of connecting panels each positioned respectively between and joining adjacent side panels, each of said connecting panels having at least a portion thereof movable to a position out of the planes of said side panels and in a direction towards said central panel portion.

4,678,089

DISPLAY STAND

Franz J. Lang, Kelkheim, Fed. Rep. of Germany, assignor to Display-Design GmbH für moderne Verkaufsförderungsmittel und Raumausstattung, Kelkheim, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,309
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428554
Int. Cl.[4] A47F *3/14*
U.S. Cl. 211—133 **10 Claims**

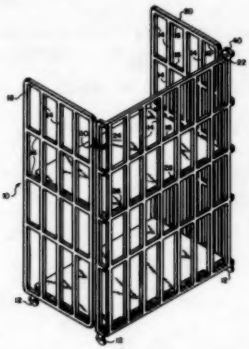


1. A display stand comprising a pedestal (**10**), a carrier column (**12**) supported by the pedestal (**10**) and at least one goods carrier (**14**) secured on the carrier column (**12**), said pedestal (**10**) comprising a lower part (**10*a***) and an upper part (**10*b***), said lower part (**10*a***) having a base portion (**10*h***) and an upwardly tapered sleeve portion (**10*i***) above said base portion (**10*h***), said tapered sleeve portion (**10*i***) being provided with an upper transversal wall having a central opening (**10*k***), said upper transversal wall (**10*k***) being provided in a central part thereof with a downwardly tapered reception pit (**10*c***), said reception pit (**10*c***) being provided with an upper ledge and a bottom wall (**10*l***) at the lower end thereof, said bottom wall (**10*l***) being provided with an upwardly directed projection (**10*d***), a detachable centering washer (**10*e***) covering the upper end of said column reception pit (**10*c***), said centering washer (**10*e***) having lateral peripheral extensions which pass downwardly through corresponding slots in the edge of the transversal wall central opening, wherein upon rotation of said washer, said extensions are misaligned from said slots thereby locking said washer between the transversal wall and said upper ledge; to the upper end of said carrier column reception pit (**10*c***) on about the level of said upper transversal wall (**10*k***) by bayonet catch means, said centering washer (**10*e***) having a central opening (**10*m***), said carrier column being a hollow tube having an inner cross-sectional area receiving said fixing projection (**10*d***) and an outer cross-sectional area received by said central opening (**10*m***) of said centering washer (**10*e***), said upper part (**10*b***) having a sleeve portion (**10*n***) and an upper terminal wall (**10*o***), said sleeve portion (**10*n***) of said upper part (**10*b***) being a smooth upwardly tapered continuation of said sleeve portion (**10*i***) of said lower part (**10*a***), an inwardly recessed fixation step (**10*p***) being provided adjacent the upper end of said tapered sleeve portion (**10*i***) of said lower part (**10*a***), said tapered sleeve portion (**10*n***) of said upper part (**10*b***) having a lower edge portion (**10*q***), said lower edge portion (**10*q***) being received by said inwardly recessed fixation step (**10*p***).

4,678,090
LATCH

Sherwood B. Ross, Miami, Fla., assignor to Ross Bicycles Inc., Rockaway Beach, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,756
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—150 **7 Claims**



1. An improved latch for selectively securing and releasing a shelf in a storage unit having side and rear panels and hinge means connecting said side panels to said rear panel, comprising:

a pivot leg rotatable about a bolt means of said hinge means;

a first connecting leg extending at an approximate angle of 90° from said pivot leg and said first connecting leg extending along a respective side panel and outside said storage unit;

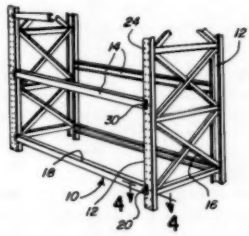
a second connecting leg extending at approximately an angle of 45° from said first connecting leg; and

a support leg extending at an approximate angle of 45° from said second connecting leg and extending within said storage unit to selectively secure said shelf in a storage position.

4,678,091
BEAM TO COLUMN CONNECTION

Anthony N. Konstant, Winnetka, and John J. Weider, Arlington Heights, both of Ill., assignors to Konstant Products, Inc., Skokie, Ill.

Filed Aug. 7, 1986, Ser. No. 894,363
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—191 **9 Claims**



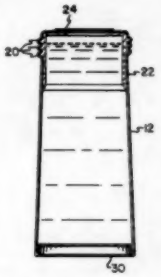
1. In a structure which comprises at least one column connected to at least one beam positioned in transverse relation to said column, said column defining a first aperture and said beam defining a second aperture, the improvement comprising, in combination:

means for retaining said beam and column in tight contact in which said first and second apertures overlap each other in offset relation, said means including bolt means extending through said overlapping apertures, said first and second apertures being each of larger diameter than said bolt means, the distance of overlap between said first and second apertures in said positions of registry being less than the diameter of said bolt means.

4,678,092
DISPOSABLE BABY BOTTLE

Melody A. Rane, 501 Ryan Ct., Eureka, Calif. 95501

Continuation of Ser. No. 677,291, Dec. 3, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 874,900
Int. Cl.[4] A61J 9/00
U.S. Cl. 215—11 E **1 Claim**



1. A disposable cartridge feeding bottle for cooperative engagement to a baby bottle nipple and baby bottle retaining ring, said baby bottle retaining ring including an aperture through which said nipple is pushed and maintained and having downwardly depending female threads for engagement to male threads on the outside of said feeding bottle;

said disposable cartridge feeding bottle comprising:

a pouch, constructed from a substantially cylindrical, lightweight, flexible, liquid impermeable plastic, said pouch configured as a frustum having an enlarged, enclosed, lower end and an upper end extending upwardly to and toward a nipple receiving end of said bottle;

a substantially rigid ring member, circumferentially coupled to the inside of said pouch proximate the upper end thereof, said substantially rigid ring member having a frustum shape complementary to the frustum shape of the upper end of said pouch;

said substantially rigid ring member further defining on the exterior surface thereof a plurality of male spiral threads disposed about the circumferential surface thereof and adapted to cooperate with the female threads of said baby bottle retaining ring;

the upper end of said frustum shaped pouch conformed to and over the exterior surface of said frustum shaped substantially rigid ring member and over the exterior surface of said male defined threads and onto and over an inwardly extending annulus defined at the upper end of said threads whereby said lightweight, flexible, liquid impermeable plastic covers said ring member;

a sealing cover disposed to overlay the open of said pouch at said ring member over said annulus whereby said annulus forms a rigid contact surface for adhering said sealing cover over the top of said pouch, said sealing cover including an outwardly extending pull tab integrally formed at one edge of said sealing cover and adapted to cooperate with the sealing cover so that said bottle may be grasped at said ring member and the cover can be removed by pulling upwardly on the tab when it is desired to obtain access to food product contained within said sealed pouch;

said substantially rigid ring member and pouch defining at the portion of said pouch overlying the threads on said ring member the threads for said baby bottle retaining ring whereby said nipple and baby bottle retaining ring can be threaded onto said ring members; and

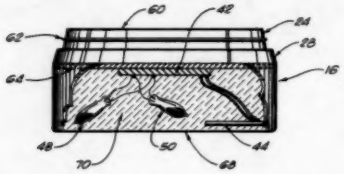
a self-supporting rim comprising a crimped, reinforced circular rim provided at the lower end of said pouch.

4,678,093

MUSICAL BABY BOTTLE

Sammy G. Allen, Magnolia, Tex., assignor to Ronny Sewalt, Magnolia, Tex.

Filed Dec. 19, 1985, Ser. No. 811,102
Int. Cl.[4] A61J 9/00; G10H 5/04
U.S. Cl. 215—11 R **3 Claims**



1. A musical baby bottle comprising:

a nipple;

a liquid container connected to said nipple such that a liquid passes from said liquid container to said nipple, said liquid container having an opening at the end opposite said nipple;

a base section fastened to said opening of said liquid container, said base section having a generally round exterior configuration, said base section having a beveled upper surface which engages the inner surface of said liquid container, said beveled upper surface slidingly engaging said inner surface of said liquid container, said base section having a lip extending from said beveled upper surface, said lip engaging said inner surface of said liquid container, said base section having a flat surface across the top of said beveled upper surface, said flat surface sealing the interior of said base section from the interior of said liquid container, said base section having a shoulder area formed at the bottom of said beveled upper surface, said shoulder abutting the end of said liquid container;

a microchip having musical information encoded therein, said microchip fastened to the interior portion of said base section, said microchip fastened to the side of said flat surface opposite the interior of said liquid container;

an insulating layer fastened to the side of said flat surface opposite the interior of said liquid container, said microchip fastened to the opposite side of said insulating layer from said flat surface;

a speaker electrically connected to said microchip, said speaker fastened within the interior of said base section, said speaker being a generally flat speaker, said speaker positioned adjacent an outer surface of said base section;

a battery electrically connected to said microchip, said battery fastened within the interior of said base section; and

switch means electrically connected to said microchip, said switch means for selectively activating said microchip, said switch means responsive to external stimulus acting on said baby bottle, said switch means comprising:

a first mercury switch fixedly positioned within said base section, said first mercury switch tilted such that the off-position of said switch is tilted toward the bottom of said base section, the on-position of said first mercury switch being farther from the bottom of said base section than said off-position;

a second mercury switch fixedly positioned within said base section, said second mercury switch being angularly offset by 90 degrees from said first mercury switch; and

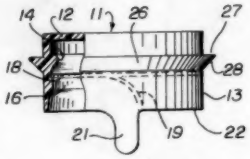
a third mercury switch fixedly positioned within said base section, said third mercury switch angularly offset by 90 degrees from both said first mercury switch and said second mercury switch, said second and third mercury switches having an off-position closer to the bottom of said base section than the on-position, said first, second and third mercury switches responsive to an angular movement of said baby bottle, said first, second and third mercury switches connected to said microchip such that when any of said mercury switches are in the on-position, the microchip is activated to release the encoded musical information.

4,678,094

TAMPER-RESISTANT CONTAINER CAP

Joseph J. Bullock, Atherton, Calif., assignor to Bankers Trust Co., New York, N.Y.

Filed Apr. 29, 1986, Ser. No. 857,197
Int. Cl.[4] B65D 41/48
U.S. Cl. 215—256 **17 Claims**



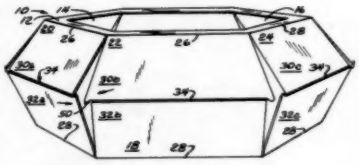
1. A tamper-resistant tearable cap for a container comprising a top disk, a skirt depending from the periphery of said top disk, bead means on the interior of said skirt cooperable with cooperating means on a container neck to secure said cap on said neck while said skirt is intact, score means on said skirt, a tear tab on said skirt adjacent said score means whereby upon pulling said tear tab said skirt may be torn to disengage said bead means from said cooperating means, and a peripheral flange on the exterior of said skirt located substantially below said disk, said score means comprising a horizontal circumferential score line and said flange being located immediately above said circumferential score line, said flange preventing tearing of said skirt above the level of said flange.

4,678,095

COLLAPSIBLE CONTAINER

Earl D. Barnett, Glenview, and Robert W. Mundstock, Schaumburg, both of Ill., assignors to Chicago Show Printing Co., Morton Grove, Ill.

Filed May 2, 1986, Ser. No. 858,685
Int. Cl.[4] B05D 5/36
U.S. Cl. 220—4 F **5 Claims**



1. A one piece collapsible container comprising:

(a) a bottom panel of polygonal shape having at least three sides;

(b) a top panel of polygonal shape having the same number of sides as the bottom panel;

(c) a plurality of side panels hingedly secured to said top and bottom panels, respectively, the top side panels also being hingedly connected to the bottom side panels to permit movement between deployed and collapsed positions, said top and bottom side panels folding outwardly to a substantially flat, juxtaposed position when the container is collapsed;

(d) interlocking means carried by said top and bottom side

panels for securing top side panels to the bottom side panels in the deployed position.

4,678,096

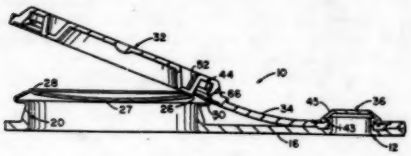
INTEGRAL RIVET

Robert L. LaBarge, Ben Avon Borough, and Frank E. Maier, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 738,975, May 29, 1985, Pat. No. 4,580,692. This application Apr. 3, 1986, Ser. No. 847,772

Int. Cl.[4] B65D *17/46*

U.S. Cl. 220—273 5 Claims



1. A rivet integral with a sheet metal panel for fastening an object to the panel, comprising:

a hollow cylindrical shank projecting upwardly from the panel:

an end wall across the shank end away from the panel; and

a flange extending outwardly from the shank and downwardly from the periphery of the end wall.

4,678,097

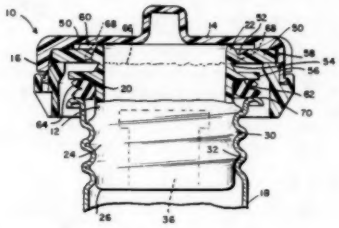
BREAKAWAY GAS GAP

Billy G. Crute, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Jul. 9, 1986, Ser. No. 883,563

Int. Cl.[4] B65D *41/04, 41/32*

U.S. Cl. 220—288 10 Claims



1. A cap for closing an automobile fuel fill neck comprising:

an axially extending housing adapted to engage and seal said neck;

said housing having a radially outwardly extending first flange on the axially upper portion of said housing, said first flange including a frangible portion;

an outer cover attached to said first flange;

said housing also having a radially outwardly extending second flange spaced axially downwardly from said first flange, said second flange configured to engage a gasket in said fill neck to seal said neck, whereby an impact on said outer cover will fracture said frangible portion of said first flange leaving said housing and said second flange intact to seal said neck.

4,678,098

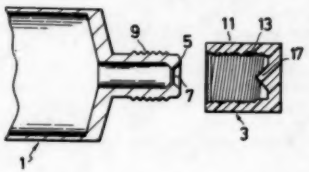
FASTENING STRUCTURE OF TUBE AND CAR ASSEMBLY

Yasuo Oka, 23-24 Yohsai, Momoyama-cho, Fushimi-ku, Kyoto-shi, Kyoto-fu, Japan

Filed Mar. 24, 1986, Ser. No. 843,234

Int. Cl.[4] B65D *41/04*

U.S. Cl. 220—289 9 Claims



1. A fastening structure of a tube and cap assembly, comprising:

a mouth member projecting outwardly from said tube;

a first threaded portion formed on the periphery of said mouth member;

a cap with a second threaded portion formed on the inner surface thereof, said second threaded portion being screwed on said first threaded portion of said mouth member to constitute a tube and cap assembly and being selectively unscrewable therefrom;

one of said threaded portions made of material having a certain predetermined degree of hardness;

an unthreaded stopper portion formed on the other of said threaded portions, said unthreaded stopper portion made of plastic material softer than the hardness of said one threaded portion such that the screwing motion of said cap on said mouth member toward said tube is stopped by the stopper portion when said cap is screwed with torque not exceeding a limit value; and,

when said cap is screwed with torque exceeding the limit value, said screwing motion of said cap plastically deforms said unthreaded stopper portion to overcome the resistance of the unthreaded stopper portion and is continued until a leading end inner surface of said cap abuts against a part of said mouth member.

4,678,099

CONTAINER FOR STORING STACK OF THIN AND SOFT SHEET MATERIALS

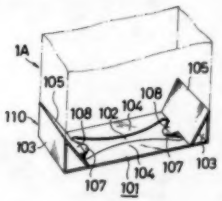
Sumio Matsui, 5-7, Kitami 9-chome, Setagaya-ku, Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 783,342

Claims priority, application Japan, Feb. 19, 1985, 60-29390; Aug. 29, 1985, 60-188504

Int. Cl.[4] B67H *1/00*

U.S. Cl. 221—48 4 Claims



1. A container having a discharge port on the underside of said container for containing therein a stack of thin and soft sheets of material having edges overlapping folded portions of adjacent sheets so that after dispensing of one sheet a leading end of a next sheet protrudes through said discharge port to be

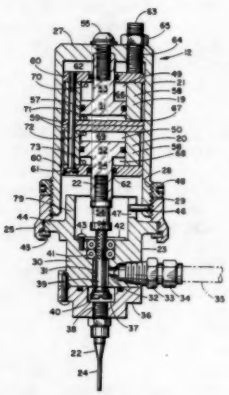
ready for a subsequent dispensing operation by a user, said discharge port being defined by a least one pair of opposing flexible lugs and being enlarged by said one sheet when the sheet is drawn out of the container while contacting and pushing down initially one of said flexible lugs and then contacting and pushing down the other one of said flexible lugs, at least one pair of opposing upper bolster members being disposed above said flexible lug pair for bearing the weight of said stack of thin and soft sheets of material and for guiding said thin and soft sheets of material to said discharge port, each tip end of said pair of opposing upper bolster members protruding beyond the marginal edge of said discharge port downwards beyond the underside of said flexible lugs.

3. A container having a discharge port on the underside of said container for containing therein a stack of thin and soft sheets of material having edges overlapping folded portions of adjacent sheets so that after dispensing of one sheet a leading end of a next sheet protrudes through said discharge port to be ready for a subsequent dispensing operation by a user, said discharge port being defined by at least one pair of opposing flexible lugs and being enlarged by said one sheet when the sheet is drawn out of the container while contacting and pushing down initially one of said flexible lugs and then contacting and pushing down the other one of said flexible lugs, at least one pair of opposing upper bolster members being disposed above said flexible lug pair for bearing the weight of said stack of thin and soft sheets of material and for guiding said thin and soft sheets of material to said discharge port, each tip end of said pair of opposing upper bolster members abutting against the underside of each of the flexible lugs so that each of said pair of flexible lugs is bent downwards to guide the thin and soft sheet materials to be drawn out of said container.

4,678,100
VARIABLE FLOW RATE DISPENSING VALVE ASSEMBLY

William A. Gelinas, Hadley, Mass., and Robert N. McDermott, Wethersfield, Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Jun. 17, 1985, Ser. No. 745,655
Int. Cl.[4] B05C *11/00*
U.S. Cl. 222—52 **9 Claims**



1. A material dispensing valve comprising:

back to back, first and second cylinders comprising closed bodies defining respective internal first and second chambers, first and second pistons in sliding arrangement within said respective first and second internal chambers, said pistons dividing each such chamber into a first section adjacent one side of each respective piston and a second section adjacent the other side of each respective piston, first and second piston rods connected to said respective first and second pistons, said piston rods extending in opposing directions and outwardly of said bodies, said sections being arranged such that the second section of each chamber are arranged adjacent one another;

a first port in said first body arranged to communicate with said first section of said first chamber;

a second port in said first body arranged to communicate with said second section of said first chamber;

a third port in said second body arranged to communicate with said second section of said second chamber;

a fourth port in said second body arranged to communicate with said first section of said second body;

said ports being adapted for alternatively pressurizing or exhausting chamber sections;

a housing for supporting said bodies for movement relative thereto, said first piston rod being secured to said housing;

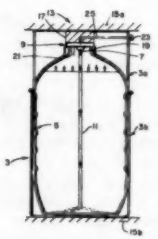
means connected to said housing for rapidly and precisely dispensing said material without excess on a workpiece, said dispensing means including a valve for controlling the dispensing rate of said material and actuating means for selectively positioning said valve in at least three positions providing at least a high dispense rate for a first position, a low dispense rate for a second position and no dispense rate for a third position, said actuating means comprising said first and second cylinders wherein said valve is connected to said second piston rod; and

control means for selectively controlling said actuating means for pressurizing or exhausting said respective sections of said cylinders through said ports to adjust said valve to a desired valve dispensing position wherein said first valve position is obtained by said first port being exhausted, said second port being pressurized, said third port being pressurized and said fourth port being exhausted, said second valve position is obtained by said first port being pressurized, said second port being exhausted, said third port being pressurized and said fourth port being exhausted, said third valve position is obtained by said first port being pressurized, said second port being exhausted, said third port being exhausted and said fourth port being pressurized whereby said valve is operationally responsive to the movement of said second piston rod to provide said at least three valve positions.

4,678,101
DISPENSING CONTAINER CLOSURE

Harold L. Nitchman, 1230 Parody, St. Charles, Mo. 63301, and William B. Cunningham, Jr., 916 Woodshire, Creve Coeur, Mo. 63141

Continuation-in-part of Ser. No. 487,561, Apr. 22, 1983, Pat. No. 4,531,656, which is a continuation-in-part of Ser. No. 439,115, Nov. 4, 1982, which is a continuation-in-part of Ser. No. 363,511, Apr. 2, 1982, Pat. No. 4,491,247, which is a continuation-in-part of Ser. No. 285,611, Jul. 21, 1981, Pat. No. 4,440,319. This application Jul. 25, 1985, Ser. No. 759,073
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—82 **4 Claims**



1. In a pressurized liquid dispensing system comprising a container having a mouth, said container being of a suitable

synthetic resin and being incapable of withstanding internal pressurization forces necessary for pressure dispensing of said liquid, means receiving said container for withstanding axial and circumferential pressure forces exerted on said container upon internal pressurization thereof, said pressure withstanding means comprising a shroud body receiving at least a portion of said container, a shroud top telescopically received by said shroud body, and means for securing said shroud body and shroud top together so that said shroud body and shroud top withstands circumferential pressure forces and said securing means withstands axial pressure forces, said shroud top having a first puncturing tube disposed along the axial centerline of said shroud top through which liquid from within said container may be dispensed, and a second puncturing tube located radially outwardly from said first puncturing tube which may be selectively connected to a source of compressed gas, wherein the improvement comprises: a closure for closing said mouth of said container, means for sealably securing said closure to said mouth, a dip tube operatively associated with said closure, said dip tube being located generally at the center of said closure, said closure having a first puncturable area at the center of said closure in register with said dip tube for closing said dip tube and a second puncturable area located radially outwardly from said dip tube and extending circumferentially around said first puncturable area such that with said container received within said shroud body and with said shroud top telescopically applied to said shroud body, said first puncturing tube is in axial register with said first puncturable area and said second puncturing tube is in register with said puncturable area without the necessity of rotatably aligning said container and said shroud top relative to one another such that upon inward axial movement of said shroud top with respect to said shroud body said first puncturing tube punctures said first puncturable area thereby to open communication with said dip tube and said first puncturing tube and said second puncturing tube punctures said second puncturable area at any circumferential position therearound in register with said second puncturing tube thereby to admit said compressed gas into said container for the pressurized dispensing of said liquid via said dip tube.

4,678,102

CONTAINER HAVING A HOOKED-SHAPED MEMBER SLIDABLY ATTACHED THERETO

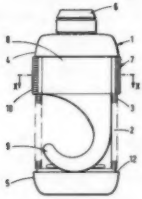
Geoffrey A. Ryder, Welwyn Garden City, England, assignor to Beecham Group p.l.c., England

Filed Oct. 1, 1985, Ser. No. 782,507

Claims priority, application United Kingdom, Oct. 3, 1984, 8424958

Int. Cl.[4] B67D 5/06

U.S. Cl. 222—181 **5 Claims**



1. A container for dispensing viscous liquids, comprising a hollow resiliently deformable body having top and bottom ends connected by a body wall, a valve cap mounted at the top end of the body, and a hook-shaped member attached to the body for slidable movement along the body wall in a direction between the top and bottom ends, the hook shaped member comprising an arcuate portion arranged to encircle at least partially the deformable body, and a hook depending from the arcuate portion and extending in a direction parallel to the body wall and being shaped and contoured to follow the body cross-section, the body and the hook-shaped member having mutual stop means to limit slidable movement of said hook-shaped member between a retracted position which causes said hook to lie along said body wall and not project beyond the bottom end of the body and an extended position which causes said hook to project beyond said bottom end, whereby the member may be extended to suspend the container in an inverted position and retracted when the container is not in use.

4,678,103

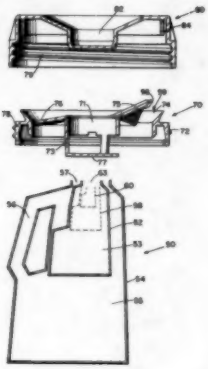
PLURAL-CHAMBERED DISPENSING DEVICE EXHIBITING CONSTANT PROPORTIONAL CO-DISPENSING AND METHOD FOR MAKING SAME

Robert S. Dirksing, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 27, 1986, Ser. No. 844,919

Int. Cl.[4] B67D 5/56

U.S. Cl. 222—130 **15 Claims**



1. A device for simultaneously dispensing at least two flowable products by the force of gravity alone, said device comprising:

(a) an outer container defining an outer chamber and having an upper portion, said outer chamber adapted to contain a first flowable product, said upper portion having a first discharge opening;

(b) an inner container defining an inner chamber adapted to contain a second flowable product and being fixedly disposed within said outer container, said inner container having a second discharge opening; and

(c) a third empty container disposed within said inner chamber, said third empty container being so shaped and fixedly positioned relative to said inner and outer containers that incremental dispensing of said first and second flowable products is maintained at a substantially constant, predetermined ratio.

4. A device for simultaneously dispensing at least two flowable products by the force of gravity alone, said device comprising:

(a) an outer container defining an outer chamber and having an upper portion, said outer chamber being adapted to contain a first flowable product, said upper portion having a first discharge opening therein; and

(b) an inner container defining an inner chamber adapted to contain a second flowable product and being fixedly disposed within said outer container, said inner container having a second discharge opening, said inner container being so shaped and fixedly positioned relative to said outer container that the impact of said inner container on the pouring characteristics of said first flowable product in said outer container is simulated on the pouring charac-

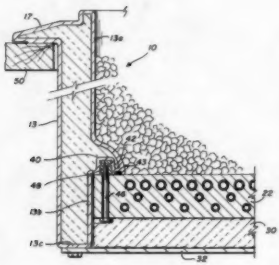
teristics of said second flowable product in said inner container, whereby incremental dispensing of said first and second flowable products is maintained at a substantially constant, predetermined ratio without either said first or said second discharge openings becoming inundated by said first or said second flowable products, respectively.

4,678,104

COLD PLATE FOR BEVERAGE DISPENSING

James D. Pritchett, Plano, Tex., assignor to Booth, Inc., Dallas, Tex.

Filed Nov. 13, 1984, Ser. No. 670,618
Int. Cl.[4] B67D 5/62
U.S. Cl. 222—146.6 **6 Claims**



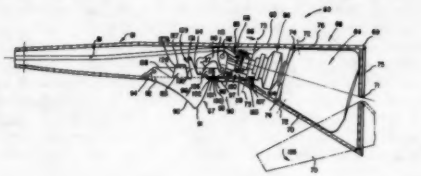
1. A cooling system for dispensing beverages comprising:
(a) a tubular tub member, adapted for disassembly with a cooperating cooling-plate, open at the top and bottom and defining an inner wall, said tub member having a ledge portion extending from the inner wall of the tub member into the interior thereof about the entire periphery of the inner wall at a given distance from the bottom of the tub member, said ledge having a planar downwardly facing rabbet and a channel;
(b) a flat cast metal cooling plate, adapted for disassembly from the tub member, having syrup and water cooling coils cast in said plate, said metal plate having a plurality of bolt receiving holes passing therethrough distributed about the periphery of the metal plate near the exterior edges of the metal plate;
(c) a resilient gasket for positioning between the downwardly facing rabbet of said tub and the top of the plate to form a watertight seal between the plate and the tub;
(d) said channel adapted to receive a plurality of threaded inserts, said inserts opening through the rabbet;
(e) a plurality of bolts, each bolt inserted through a hole in said metal plate from the bottom of the plate to threadedly engage a threaded insert to compress the resilient gasket between the top surface of the metal plate and the rabbet to form a water tight seal therebetween, said bolts thereby adapted for disassembly of the plate from the tub member, whereby said tub member may be readily repeatedly filled with ice for maintaining said plate at a low uniform temperature while cooling cold beverages which pass through said coils and which may readily disassemble for ease of repair and cleaning.

4,678,105

SAFETY LOCK MECHANISM FOR CLEANING WAND

Samuel C. Heck, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 592,945, Mar. 23, 1984, which is a continuation-in-part of Ser. No. 478,516, Mar. 24, 1983, Pat. No. 4,534,669. This application Sep. 20, 1984, Ser. No. 652,864
Int. Cl.[4] B67D 5/32
U.S. Cl. 222—153 **6 Claims**



1. A cleaning wand having a safety lock mechanism, comprising:
a handle;
a cleaning head on one end of said handle;
a trigger pivotally mounted within a slot in said handle;
a pivotal door on an end of said handle opposite said cleaning head; and
a button having an elongate engagement member connected thereto in operative engagement therewith, said button connected to said engagement member in approximately the center of said engagement member, said engagement member having a first end toward said cleaning head and a second end toward said door, said button received within a button slot within said handle, said button alternately slidable within said button slot to a first position toward said cleaning head, a second position in approximately the center of said button slot, and a third position toward said door, said trigger being adapted for alternate engagement with or disengagement from said first end of said engagement member, said door having a stop member for alternate engagement with or disengagement from said second end of said engagement member, said first end of said engagement member engaging said trigger and said second end of said engagement member being disengaged from said stop member when said button is in said first position, to impede pivoting of said trigger and permit opening of said door, said first end of said engagement member engaging said trigger and said second end of said engagement member engaging said stop member when said button is in said second position, to impede pivoting of said trigger and impede opening of said door, and said first end of said engagement member being disengaged from said trigger and said second end of said engagement member being engaged with said stop member when said button is in said third position, to permit pivoting of said trigger and impede opening of said door.

4,678,106

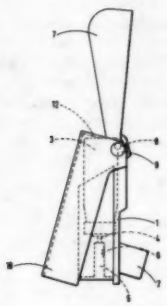
DISPENSING DEVICE

Robert E. Newell, Pinner; Paul K. Rand, Hitchin, and Carole A. Osterweil, London, all of England, assignors to Glaxo Group Limited, London, England

Filed Jul. 30, 1985, Ser. No. 760,596
Claims priority, application United Kingdom, Jul. 31, 1984, 8419437
Int. Cl.[4] B67D 5/64
U.S. Cl. 222—162 **7 Claims**

1. A device for dispensing a mixture of propellant and product from a pressurized aerosol container having an outlet valve, comprising a housing receiving, or adapted to receive, a pressurized aerosol container, the housing having an outlet spout near one end thereof; a cover; cooperating pivot means

on the cover and on the housing near the other end thereof, which provide for pivotal movement between the cover and the housing about a first axis, the cover being pivotal from a closed position in which it encloses the outlet spout to an open position in which the outlet spout is exposed; an actuator lever having a portion disposed to be engagable with the container to exert an axial force thereon; cooperating pivot means on the cover and the lever which provide for pivotal movement between the cover and the lever, the lever being pivotally closable onto a portion of the housing not covered by the



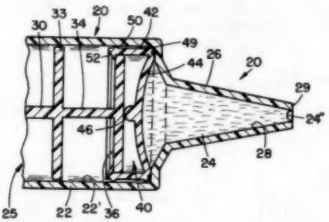
cover, pivotal movement between the cover and lever being about a second axis which is parallel to said first axis and is spaced therefrom, whereby movement of the cover from its closed position to its open position shifts the position of said first axis with respect to said second axis, said shift being such as to bring said container-engaging portion of said lever into engagement with said cover so that when the lever is closed on the housing it exerts a force on the container to displace the container with respect to the housing and to open the outlet valve of the container to dispense said mixture from the container through the outlet spout.

4,678,107

DRIPLESS DISPENSER FOR LIQUIDS AND VISCOUS FLUIDS

James F. Ennis, III, Preston, Conn., assignor to Mark L. Anderson, Elmwood, Wis.

Filed Aug. 2, 1985, Ser. No. 762,305
Int. Cl.[4] B67D *5/00*
U.S. Cl. 222—386.5 **7 Claims**



1. A fluid dispensing device, comprising:

a cylindrical barrel for containing a fluid to be dispensed;

a nozzle at a forward end of said barrel for discharging fluid from barrel, said barrel having an open rear end;

an elongated plunger having one end insertable axially into said barrel through said open rear end thereof; and a cup-shaped cylindrical cap fitted to said one end of said plunger in said barrel, said cap having an axially extending sidewall with external circumferential beading providing fluid tight sealing between said cap and said barrel and having a flexible, elastic externally concave end wall for applying pressure to fluid in said barrel to force the same out of said nozzle when said plunger is axially advanced in said barrel, said one end of said plunger being disposed adjacent to and confronting an internal side of said end wall, the internal side of said end wall being formed convexly, said end wall of said cap being sufficiently flexible and elastic to assume an axially stressed, flattened out configuration when a forwardly directed force is applied to the internal side of said end wall by said one end of said plunger upon advancement of said plunger in said barrel, and to reassume said external concave configuration when said force and stress are released, thereby creating a suction in said barrel ahead of said end wall to draw back fluid in said nozzle and prevent dripping of fluid from said nozzle;

said end wall of said cap having formed on the external surface thereof, where the end wall is joined to the sidewall, a circumferentially extending, peripheral groove providing a reduced thickness region to relieve radial and circumferential pressure on said end wall when said end wall is flattened out under axial stress; and

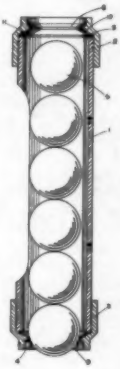
a knob centrally located on said internal convex side of said end wall for contact by said one end of said plunger, such that said end wall will assume a flat position when a forwardly directed force is exerted thereon by said one end of said plunger.

4,678,108

GOLF BALL CARRIER

Charles S. Inman, 1506 - Fifth St., New Brighton, Pa. 15066

Filed Jun. 18, 1986, Ser. No. 875,472
Int. Cl.[4] A47F *1/08*
U.S. Cl. 224—274 **10 Claims**



1. A device for carrying golf balls, comprising: a normally vertical rigid plastic elongated tubular section with an elongated sight opening extending for the major part of the length of the said tubular section, with said sight opening width at inside wall of said tubular section being less than 1.62 inches, having affixed top and bottom rigid plastic reducing coupling end pieces, with said bottom reducing coupling having its bottom opening less than 1.62 inches, with said top reducing coupling having its top opening greater than 1.68 inches, with said top reducing coupling positioned on said tubular section to loosely retain a flexible annular ring between upper rim of said tubular section and inside of said top reducing coupling, with inside of said top reducing coupling contoured to allow upward flexing of said flexible annular ring, with said tubular section having a wall thickness to retain and yet to allow downward flexing of said flexible annular ring, with said flexible annular ring sized to allow entry and exit of said golf balls from said carrier device using finger pressure to cause flexing

of the said annular ring by the said golf ball, with said flexible annular ring in relaxed condition preventing exit of said golf balls, with said flexible annular ring being removable and replaceable, thereby allowing use of said carrier device for storage of said golf balls of U.S.G.A diameter dimension or for storage of said golf balls of British diameter dimension by insertion of said flexible annular ring in said carrier device with said flexible annular ring having an inside diameter slightly smaller than the outside diameter of said golf balls being stored in said carrier device, and with said carrier device having holes and/or other attaching means for mounting said carrier device on a support.

4,678,109

TRACTOR MECHANISM FOR PRINTERS

Bengt-Ake Henriksson, Svangsta, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

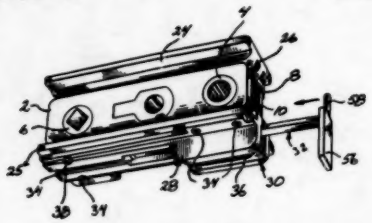
PCT No. PCT/SE85/00079, § 371 Date Oct. 10, 1985, § 102(e) Date Oct. 10, 1985, PCT Pub. No. WO85/03671, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 15, 1985, Ser. No. 795,343

Claims priority, application Sweden, Feb. 17, 1984, 8400857

Int. Cl.[4] B41J *11/26;* **B65H** *20/20*

U.S. Cl. 226—74 **10 Claims**



1. Device in tractor mechanisms for paper traction feed printers and typewriters, such a mechanism including an endless belt (8) in a holder (2), the belt being mounted for movement in its endless direction, as well as a drive connection for the belt, which belt has external teeth (10) intended for driving a printing medium such as a paper web or the like through the printer on movement of the belt, by engagement with a row of holes along an edge of the medium, the holed edge and the toothed belt running in a gap (14) defined by two wall portions (18, 22) of the holder, the height of the gap being less than the height of the teeth (10) plus the thickness of the belt, the wall portion facing towards the teeth having a groove (26) for the teeth, characterized in that the holder (2) carries a printing medium insertion means with a feeder (32) movable independent of the two wall portions, said feeder movable from an extended printing medium engagement position, in which a hole arrangement means (58) carried by the feeder is brought into engagement with a part of the row of holes in the printing medium intended for insertion in the gap (14), is movable together with the printing medium to a drawn-in position in which a plurality of holes in the row of holes are brought into engagement with teeth (10) in the gap (14), there being moving means (36, 54) carried by the holder and disposed in association with the drawn-in position to move the hole engagement means (58) out of engagement with the row of holes.

4,678,110

VEHICLE BODY ASSEMBLY SYSTEM

Tatuhiro Handa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed May 24, 1985, Ser. No. 737,425

Claims priority, application Japan, May 26, 1984, 59-106721

Int. Cl.[4] B23K *37/00*

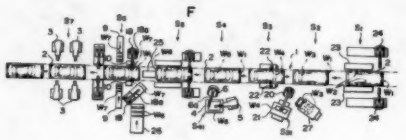
U.S. Cl. 228—4.1 **3 Claims**

1. A vehicle body assembly system for feeding various body components to respective body members conveyed in succession along a vehicle body assembly line and assembling the body member and the body components together, comprising:

at least one first component feeding station means disposed along the vehicle body assembly line for feeding a body component of a first type which can be placed by itself on the body member which is being conveyed along the vehicle body assembly line, onto the body member;

at least one second component feeding station means disposed along the vehicle body assembly line for feeding a body component of a type which cannot be placed by itself on the body member which is being conveyed along the vehicle body assembly line, onto the body member;

at least one first robot associated with and provided adjacent to the at least one first component feeding station means for welding the first type of component at a sub-assembly table which is disposed near the first component feeding station means and for placing the welded first type of component onto the body member;



a locating device associated with and disposed adjacent to the second component feeding station means for feeding and positioning the second type of component with respect to the body member at the second component feeding station means; and

at least one second robot associated with and provided adjacent to the second feeding component feeding station means for feeding the second type of component to the locating device and welding the at least one second type of component, which is positioned with respect to the body member, onto the body member,

wherein the at least one first robot and the at least one second robot each comprise a single robot arm having a detachable end for feeding the components which can be replaced with an arm end for performing a welding operation.

4,678,111

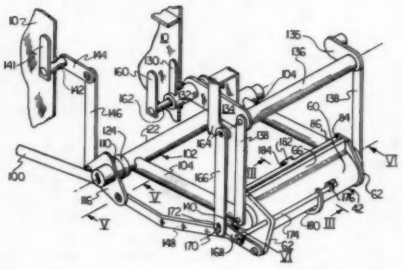
VAPOR PHASE SOLDERING MACHINE

Gerard G. Derrico, Maynard, Mass., assignor to Dynapert-HTC Corporation, Concord, Mass.

Filed Jul. 30, 1986, Ser. No. 891,934

Int. Cl.[4] B23K *1/06*

U.S. Cl. 228—37 **1 Claim**



1. A machine for soldering a work product comprising a tank for containing an electronic liquid,

heater means for heating contained electronic liquid to generate a zone of saturated vapor,

means for conveying work product through the zone of saturated vapor,

applicator means within the zone of saturated vapor for directing an extended stream of molten solder against the work product,

means for draining the molten solder from said applicator means including

means for pivotally supporting said applicator means for rotation about a horizontal axis, and

means for rotating said applicator about the horizontal axis to a drain orientation,

said applicator means including an end plate having an axially extending hole communicating with the lowermost portion of the solder within said applicator means when said applicator means has the drain orientation,

said supporting means including an end plate having a hole extending axially therethrough at a location in alignment with said applicator means end plate hole when said applicator means end plate has the drain orientation, and

means for sealing said applicator means end plate hole when said holes are not in alignment.

4,678,112

METHOD FOR PRODUCING A HEAT EXCHANGER HAVING A FLAT TUBE AND HEADER PIPES

Mikio Koisuka, and Hisao Aoki, both of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Dec. 5, 1984, Ser. No. 678,399

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—138 **5 Claims**

1. A method for producing a heat exchanger comprising a flat metal tube of an aluminum alloy for conveying fluid, and two header pipes joined respectively onto opposite ends of said flat tube, which comprises the steps of preparing said flat tube and said header pipes of an aluminum alloy other than a brazing filler metal, and preparing two brazing filler members of an aluminum alloy brazing filler metal, each of said header pipes having an axial slot in a side wall for receiving an end of said flat tube therethrough, each brazing filler member comprising an elongated plate portion arcuately curved transversely with a lengthwise elongated opening therein, and with a flat sleeve portion projecting from an outer surface of said elongated plate portion overlying said elongated opening in registration therewith, said sleeve portion having an inner surface congruent with the perimeter of said elongated opening, said sleeve portion inner surface and said elongated opening having an inner contour slightly larger than the outer contour of said flat tube; inserting each of opposite ends of said flat tube through both said sleeve portion and said elongated opening of a respective brazing filler member, and thereafter inserting each of said flat tube ends into a respective one of said header pipes through said axial slot therein while bringing said arcuately curved plate portions in contact with the outer surface of the corresponding header pipe, and then heating said brazing filler members together with said header pipes and end portions of said flat tube to melt said brazing filler members, so that said header pipes are joined and brazed to the corresponding ends of said flat tube.

4,678,113

BRUSH SEALS

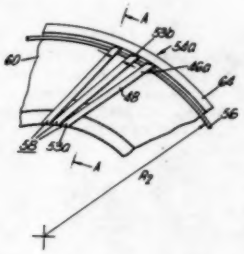
Stuart A. Bridges, and John Goddard, both of Bristol, England, assignors to Rolls-Royce plc, London, England

Filed Feb. 10, 1986, Ser. No. 827,397

Claims priority, application United Kingdom, Feb. 20, 1985, 8504331

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—160 **17 Claims**



1. A method of manufacturing a brush seal comprising the steps of:

forming a tape which comprises one or more layers of parallel contiguous lengths of filaments ahesively bonded together over substantially the entire length of said filaments to form a self supporting body;

cutting the tape into discrete portions and forming a plurality of tufts of bonded filaments therefrom;

assembling a plurality of tufts closely adjacent to each other in a support member with a part of each tuft projecting from the support member;

securing each tuft in the support member; and

removing the adhesive from at least that part of each tuft which projects from the support member.

4,678,114

METHOD OF WIRE BONDING WITH APPLIED INSULATIVE COATING

Hideharu Egawa, Tokyo, and Katsuya Okumura, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

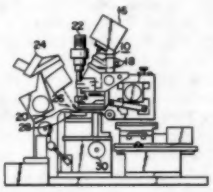
Continuation of Ser. No. 423,283, Sep. 24, 1982, Pat. No. 4,488,674. This application Oct. 24, 1984, Ser. No. 664,373

Claims priority, application Japan, Oct. 12, 1981, 56-162197

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.[4] H01L *21/60*

U.S. Cl. 228—176 **7 Claims**



1. A method for connecting a bonding pad to a lead frame of a semiconductor device through a bonding wire, comprising the steps of:

providing a bonding wire which has a core wire made of a metal and an insulating film which surrounds said core wire, said insulating film being made of a flexible resin which is thermally stable at temperatures below 200° C.,

and which thermally decomposes and scatters at a temperature of 200° to 300° C.;

thermally decomposing and scattering one end portion of said insulating film of said bonding wire and thereafter bonding the one end portion of said core wire which is exposed to said bonding pad by a nail head bonding method; and

bonding the other end portion of said core wire to said lead frame.

4,678,115

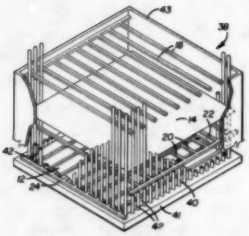
METHOD FOR MAKING LAYERED FOIL STRUCTURE

Edward D. Weisert, San Carlos, Calif., assignor to Ontario Technologies Corporation, Menlo Park, Calif.

Filed Apr. 15, 1985, Ser. No. 723,629

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—183 **3 Claims**



1. A method of forming an expanded unitary structure having a plurality of deformed foils each having an undulating cross-section, said foils having first and second sides and being stacked one upon another with said first sides facing in one direction and said second sides facing in an opposing direction, adjacent of said foils having their undulations at a non-zero angle to one another, comprising:

(A) positioning a first plurality of parallel rods against said first side of a respective one of said foils;

(b) positioning a second plurality of parallel rods against said second side of said respective one of said foils with the rods of said second plurality of rods between and parallel to the rods of said first plurality of rods;

(C) thereafter repeating steps (A) and (B) with each next adjacent foil with the rods positioned aginst said each next adjacent foil at a non-zero angle to the rods positioned against each preceeding one of said foils with the rods of every other of each of said first pluralities of rods parallel to one another and with the rods of every other of each of said second pluralities of rods parallel to one another, to define a plurality of aligned cross-over positions, until a desired number of foils and rods have been positioned, said rods serving to establish and being of a size sufficient to substantially fully define said undulating cross-sections of said foils;

(D) bonding each of said foils to each next adjacent of said foils at their points of contact to form said expanded unitary structure by applying force to compress said foils together at said cross-over positions and subjecting the compressed foils to bonding conditions to bond said foils together at said cross-over positions; and

(E) removing each of said pluralities of rods longitudinally from said expanded unitary structure;

further including, following step (C) and preceeding step (D):

positioning a non-undulating foil next to a lastmost of said undulating foils; and

using a modified rod as the last of said first plurality of parallel rods, said modified rod having a plurality of nubs contacting said lastmost of said undulating foils, said nubs being positioned substantially in alignment with said cross-over positions.

4,678,116

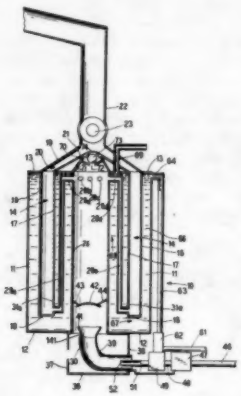
WATER HEATER

C. K. Krishnakumar, Lombard, and Clyde K. Schafer, Glendale Heights, both of Ill., assignors to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Apr. 29, 1986, Ser. No. 857,189

Int. Cl.[4] F22B *35/00*

U.S. Cl. 236—25 A **6 Claims**



1. A compact continuous flow, high efficiency water heater, comprising a generally cylindrical tank, a central flue mounted in said tank, a gas fired burner mounted to supply burning gases to said flue, a plurality of tubes connected to the top of said flue and extending downwardly through a water chamber formed in said tank to heat water therein, an annular-shaped exhaust chamber formed in said tank and said plurality of tubes connected to the lower end thereof, and with said water chamber surrounding said annular-shaped exhaust chamber, an exhaust pipe; connected to the upper end of said annular-shaped exhaust chamber to vent the burned gasses and inlet and outlet water pipes connected to said tanks, wherein said generally cylindrical outer tank is formed of material having low heat conductivity, wherein said central flue, said plurality of tubes and said annular-shaped exhaust chamber are formed of material having high heat conductivity, and comprising a gas modulator valve connected between said fired burner and a gas supply pipe and controlling the gas supply as a function of the water flow rate.

4,678,117

TEMPERATURE RESPONSIVE GAS CONTROLLER APPARATUS

Wesley J. Trahan, 1818 Julia St., and Albert B. Montandon, 706 Compton St., both of New Iberia, La. 70560

Continuation of Ser. No. 664,532, Oct. 25, 1984, abandoned. This application May 5, 1986, Ser. No. 859,389

Int. Cl.[4] G05D *27/00*

U.S. Cl. 236—92 A **7 Claims**

1. An apparatus responsive to a change in ambiant temperature, for regulating the pressure of gas within a gas pressure regulator of the type having a gas supply means, including a gas inlet and a gas outlet, said gas supply means further including a flexible diaphram member housed in the gas supply means movable between a first position for achieving maximum pressure within the system, and a second position for achieving the

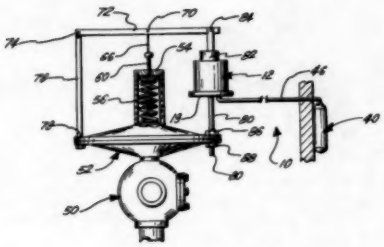
minimum pressure within the system, the apparatus comprising:

a. spring means including a base associated with the diaphram member for normally maintaining the diaphram member in the first position achieving the maximum pressure within the system;

b. means for contracting the spring to move the diaphram member toward a position to decrease the pressure within the system, said means further comprising:

i. sensing means, including a fluid expandable through an increase in ambiant temperature;

ii. a piston member receiving a fluid from said sensing means and movable upward in response to the expanse of said gas;



iii. a lever member, connectable on a first end to said piston member and movable in conjunction with said piston member; and

iv. means extending between an arm member and the base of the spring member, so that upon movement of the arm member to the up position in response to the upward movement of the piston member, the base of the spring is pulled in the up direction, imparting movement of the diaphram toward the second position decreasing the pressure in the system, and upon the arm member returning to the down position, the spring member returns to its normal first position for achieving the maximum pressure within the system.

4,678,118

DUAL-FUNCTION CAR SPOILER

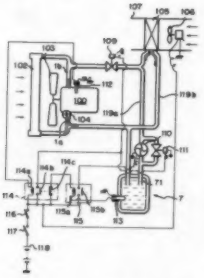
Akira Fukami, Okazaki; Takao Oshiro, Toyoake, and Hideaki Sasaya, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 15, 1984, Ser. No. 640,986

Claims priority, application Japan, Oct. 14, 1983, 58-192690; Oct. 27, 1983, 58-202453

Int. Cl.[4] B60H *1/02*

U.S. Cl. 237—12.3 B **5 Claims**



1. A hot-water type passenger compartment heating system for an automobile having an engine with a cooling system and having a dual-function car spoiler secured to the vehicle body for aerodynamically controlling the airflow around the vehicle body, said heating system comprising:

a car heater unit disposed in a heat exchange relationship with the air in the passenger compartment;

first conduit means for circulating a coolant in said cooling system through said car heater unit;

a hot coolant reservoir provided in said car spoiler in a heat insulating manner from the ambient air;

second conduit means for connecting said first conduit means to said hot coolant reservoir; and

valve means responsive to the coolant temperature for interrupting the flow of coolant from the engine to said car heater unit and circulating the coolant stored in said hot coolant reservoir through said car heater unit when the coolant temperature at the engine is below a predetermined value and for supplying the hot coolant from the engine to said hot coolant reservoir when the engine is warmed up.

4,678,119

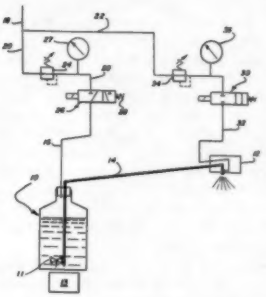
ABRASIVE SLURRY SUPPLY SYSTEM FOR USE IN METALLOGRAPHIC SAMPLE PREPARATION

Ralph R. Doyle, Des Plaines, Ill., assignor to Buehler Ltd., Lake Bluff, Ill.

Continuation of Ser. No. 433,834, Oct. 12, 1982, abandoned. This application Aug. 12, 1985, Ser. No. 765,049

Int. Cl.[4] B05B *7/24;* B24C *7/00*

U.S. Cl. 239—9 **9 Claims**



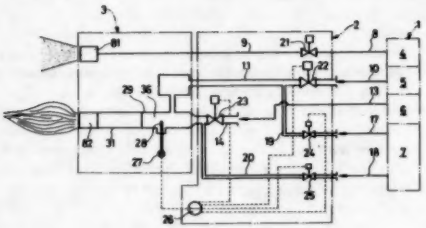
1. A method of supplying abrasive slurry to a lapping, polishing or grinding machine for preparing the surface of a metallurgical specimen, the method comprising, in combination, providing a container of abrasive slurry and connecting said container by an upwardly inclined conduit to a nozzle, supplying air under pressure through a first air passage to said container to force abrasive slurry through said upwardly inclined conduit to said nozzle, supplying air under pressure through a second air passage to said nozzle to mix air under pressure with said abrasive slurry at said nozzle to create an abrasive slurry mist, intermittently disconnecting said first air passage from said contained and, with each disconnecting step, simultaneously venting said container to atmosphere to permit abrasive slurry in said inclined conduit to drain back to said container, and substantially continuously mixing the abrasive slurry in said container.

4,678,120

REFRACTORY FLAME-GUNNING APPARATUS

Masataka Matsuo, Kitakyushu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 673,173, Nov. 19, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 912,176
Claims priority, application Japan, Nov. 22, 1983, 58-220411
Int. Cl.[4] B05B *12/10*
U.S. Cl. 239—75 5 Claims



1. A refractory flame-gunning apparatus which comprises:

a feeder comprising a refractory powder feeding section, an inflammable gas feeding section, a combustion-assisting gas feeding section, and an inert gas feeding section;

a controller for controlling the supply of refractory powder and the supply of inflammable gas, combustion-assisting gas and inert gas, said controller having an inflammable gas pipe means extending from said inflammable gas feeding section, a combustion-assisting gas pipe means extending from said combustion-assisting gas feeding section, a first inert gas pipe means extending from said inert gas feeding section and connected to said inflammable gas pipe means, a second inert gas pipe means extending from said inert gas feeding section and connected to said combustion-assisting gas pipe means, an inflammable gas valve in said inflammable gas pipe means between the point where said inflammable gas and first inert gas pipe means meet and said inflammable gas feeding section,

a combustion-assisting gas valve in said combustion-assisting gas pipe means between the point where said combustion-assisting gas and second inert gas pipe means meet and said combustion-assisting gas feeding section, a first inert gas valve in said first inert gas pipe means, a second inert gas valve in said second inert gas pipe means; and a control unit including a temperature sensor for detecting a temperature due to backfiring, the control unit including means for outputting opening and closing signals to said inflammable gas valve, said combustion-assisting gas valve and said first and second inert gas valves on the basis of signals emitted by said temperature sensor; and

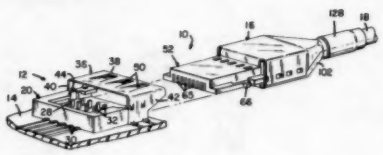
a flame-gunning burner having a plurality of refractory powder and flame ejecting nozzles disposed at the tip thereof, a gas mixer having an inflammable gas passage to which said inflammable pipe means is connected, a combustion-assisting gas passage to which said combustion-assisting gas pipe means is connected, said burner having a gas mixing chamber therein to which said inflammable and combustion-assisting gas passages are connected, and a mixed gas passage extending out of said gas mixing chamber to said flame ejecting nozzles, and a combustion-assisting gas cutoff valve in said combustion-assisting gas passage normally urged toward the closed position and held out of said closed position and having means exposed to said mixed gas passage for releasing the holding of said cutoff valve to quickly close said combustion-assisting gas passage in response to a build-up of pressure in said mixed gas passage due to backfiring, said temperature sensor being positioned in said mixed gas passage, and said outputting means in said control unit outputting signals for closing said combustion-assisting gas valve and opening said second inert gas valve when a temperature indicating backfiring is sensed, and for subsequently closing said inflammable gas valve and opening said first inert gas valve.

4,678,121

MULTIPLANE CONNECTOR SYSTEM

George H. Douty, Mifflintown, and John M. Landis, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 505,151, Jun. 17, 1983, Pat. No. 4,506,940. This application Jun. 25, 1984, Ser. No. 624,151
The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.
Int. Cl.[4] H01R *13/46*
U.S. Cl. 439—610 5 Claims



1. A connector system comprising:

a header member having a mating face in a connector receiving cavity profiled to receive a mating connector in a direction parallel to said mating face and a plurality of contacts each with one end extending from the mating face,

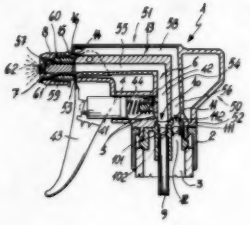
a connector member comprising a housing having a front mating end profiled for reception in said cavity, a rear terminating end, and a plurality of terminal passages extending therebetween, said mating end having a mating surface for reception against said mating face, said passages opening at said mating end as a plurality of parallel slots on said mating surface and at said terminating end as a plurality of parallel channels on opposite sides thereof, adjacent slots extending to channels on opposite sides thereof, alternate slots extending to channels on the same side, said connector member further comprising a plurality of terminals in respective passages, each terminal having a conductor engaging portion in a respective channel and a contact engaging portion in a respective slot, said slots being spaced to receive respective contacts.

4,678,122

HAND OPERATED LIQUID ATOMIZER

Antonio Riglietti, Bassano Del Grappa, Italy, assignor to ALTA S.p.A., Vicenza, Italy

Filed Apr. 11, 1986, Ser. No. 850,971
Claims priority, application Italy, Apr. 18, 1985, 30681/85[U]
Int. Cl.[4] B05B *9/04*; B65D *83/14*
U.S. Cl. 239—333 3 Claims



1. A hand-operated liquid atomizer comprising a main body of substantially L-like form defining first and second body

portions extending at substantially right angle to each other, said first body portion defining a connection end for connection to a liquid container and said second body portion defining an atomizing end; a fluid passage conduit in said main body, said fluid passage conduit defining a first fluid passage conduit part extending in said first body portion and ending at said connection end and a second fluid passage conduit part extending in said second body portion substantially at right angle to said first fluid passage conduit part and ending at said atomizing end; an auxiliary venting conduit in said main body, said venting conduit defining a first venting conduit part extending in said first body portion substantially parallel to said first fluid passage conduit part and ending at said connection end and a second venting conduit part extending in said second body portion substantially parallel to said second fluid passage conduit part and ending at said atomizing end; a venting stopper engaging with and closing said venting conduit at said atomizing end; a small venting hole in said stopper; an atomizer nozzle at said atomizing end, said nozzle having a cylindrical member defining a through passage aligned with said second fluid passage conduit part and a cylindrical shutter in said through passage having peripherally protruding portions for engaging with said cylindrical member and closing said through passage; an atomizer nozzle adjusting ring nut encircling said atomizer nozzle and having a supply hole substantially aligned with said through passage, said ring nut having a peripheral outwardly protruding flange formation facing said atomizing end and said small venting hole, said ring nut being adjustably screw thread engaged with said atomizer nozzle, thereby in a non-use fully screwed down condition of said ring nut said flange formation abutting against said venting stopper and closing said small venting hole; an atomizer pump including a pump chamber extending in said first body portion in a middle position thereof and at right angle thereto, said pump chamber being in communication with said first fluid passage conduit part, a reciprocating pump plunger movable in said pump chamber, elastic bias means in said pump chamber acting against said pump plunger for urging it in a position at least partially extracted from said pump chamber, an actuation lever hingedly attached to said main body and urging said pump plunger towards said pump chamber; first valve means including a first valve seat in said first passage fluid conduit part substantially at said connection end and a first valve closing member in said first valve seat, second valve means including a second valve seat in said first venting conduit part substantially at said connection end and a second valve closing member in said second valve seat.

4,678,123

SPRAY NOZZLE FOR A LIQUID ATOMIZER

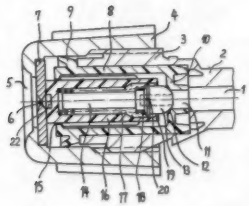
Karlheinz Klaeger, Portnerstrasse 84, 9802 Neusäess, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,489

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443640

Int. Cl.[4] B05B *1/34*; F16K *43/00, 25/00*

U.S. Cl. 239—464 **15 Claims**



1. A manually operated liquid atomizer, comprising:

a threaded housing portion having therein an opening and a pressure duct which communicates with and can carry a pressurized fluid to said opening;

a union nut which is adapted to be screwed onto said threaded housing portion and which has nozzle means thereon;

a socket adapted to be axially inserted into said opening in said threaded housing portion and having therein an axially extending cavity which receives check valve means for normally closing said pressure duct, said check valve means including a valve pin axially displaceably supported in a cavity of a cup-shaped twist member disposed coaxially in said cavity in said socket, said twist member having thereon an axially facing surface which co-operates with a surface of said nozzle means;

a resetting spring disposed within said cavity of said twist member and cooperable with a bottom wall of said twist member and said valve pin so as to bias a head portion of said valve pin against a valve seat of said check valve means; and

an annular stop flange which is provided on said valve pin and has a larger diameter than said head portion thereof, said stop flange being biased by the urging of said resetting spring toward a radially inwardly projecting holding lip which is provided at an end of said cavity in said twist member.

4,678,124

ELECTROMAGNETICALLY ACTUATABLE VALVE IN PARTICULAR A FUEL INJECTION VALVE

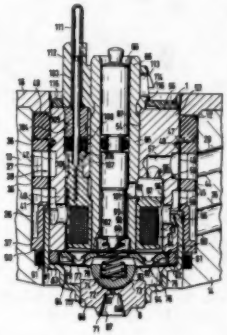
Udo Hafner, Lorch; Waldemar Hans; Wilhelm Kind, both of Bamberg; Rudolf Krauss, Stuttgart, and Rudolf Sauer, Benningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 674,729, Nov. 27, 1984, abandoned, which is a continuation of Ser. No. 415,116, Sep. 7, 1982, abandoned. This application Apr. 11, 1986, Ser. No. 851,906

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143848

Int. Cl.[4] B05B *1/30*; F02M *51/00*

U.S. Cl. 239—585 **4 Claims**



1. An electromagnetically actuable fuel injection valve for a fuel injection system of an internal combustion engine comprising a holder body (**13**), including a valve chamber, a shell (**53**) having an upper base (**55**) and a bottom face (**60**) disposed in said holder body valve chamber, whereby said upper base is arranged at one end of said shell and said bottom face is arranged at the opposite end of said shell, an axial aperture (**54**) in said base of said shell which leads from an outer face (**55**) on said base of said shell to an inner face of said base, an axial interior bore (**56**) of substantially uniform diameter in said shell that extends from said base to said bottom face and having a greater diameter than said axial aperture, a nozzle carrier

coaxial with said shell and shell holder body (valve chamber) with an axially directed extension that extends into said holder body and surround a portion of said shell and said bottom face of said shell, a spacer ring secured between said bottom face of said shell within said nozzle carrier extension and a shoulder on said nozzle carrier juxtaposed said bottom face of said shell, a guiding membrane secured between said shoulder on said nozzle carrier and said spacer ring and pressed against said spacer ring and said shoulder of said nozzle carrier, a tubular shaped core made of ferro-magnetic material that is inserted in said aperture in said shell and extends through the interior bore (56) in a direction to said bottom face of said shell, a magnetic coil wound about said core of ferro-magnetic material and disposed within said valve chamber, a substantially flat armature arranged in coaxial alignment with said magnetic coil juxtaposed an end of said core, a valve component secured to said armature coaxial therewith and movable thereby, a nozzle coaxially supported by said nozzle carrier, a dished valve seat formed on said nozzle in coaxial alignment with said valve component for reception thereof, said substantially flat armature includes a circumferential extremity which overlaps a portion of a bottom face of said shell, said substantially flat armature assumes a normal first position spaced away from said portion of said bottom face of said shell whereby a first air gap is provided in said first position when said valve is closed, and a second position in which said circumferential extremity of said armature is in abutment with said overlapped portion of said bottom face of said shell upon actuation of said magnetic coil to open said valve.

4,678,125

NOZZLE

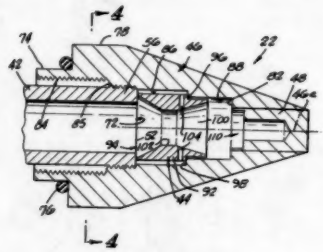
Thomas P. Elston, Randburg, South Africa, assignor to G S I Holdings (Proprietary) Limited, Transvaal, South Africa

Filed Aug. 12, 1985, Ser. No. 764,938

Claims priority, application South Africa, Aug. 13, 1984, 84/6260

Int. Cl.[4] B05B *3/14, 7/04, 1/14, 1/00*

U.S. Cl. 239—589.1 **11 Claims**



8. A nozzle unit comprising

(a) a frusto-conical nozzle having

(i) a transverse flat end face;

(ii) an outlet passage formed in the flat end face;

(iii) an inner conduit member which in use is connected to a source of pneumatic pressure;

(iv) a water conduit which in use is connected to a source of water under pressure; and

(v) a mixing chamber having

(1) a venturi passage therethrough having a low pressure section including a venturi throat which venturi passage is connected to the said inner conduit member, and

(2) inlet bores extending from the exterior of the chamber to the low pressure section of the passage, the inlet bores being connected to the water conduit;

(b) a concave cylindrical cap having

(i) an open mouth facing the outlet passage, the mouth being spaced from the end face by no more than one-half of the diameter of the throat of the venturi; and

(ii) an outer diameter which is less than the diameter of the outlet passage; and

(c) carrier means integral with the nozzle and the cap and carrying the cap on the nozzle.

4,678,126

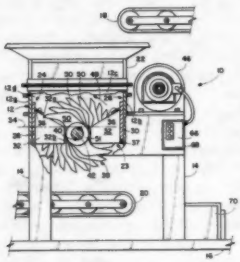
SHREDDER

Charles E. Prentice, and Nadine P. Prentice, both of Rte. 3, Box 655, Beaverton, Oreg. 97007

Filed Nov. 4, 1985, Ser. No. 794,739

Int. Cl.[4] B02C *18/16*

U.S. Cl. 241—34 **16 Claims**



1. A shredder comprising:

a housing for receiving material to be shred;

power means;

arbor means rotatably mounted in said housing and driven by said power means;

anvil means mounted in said housing; said anvil means including grating members, each grating member having a top surface which inclines downwardly toward said arbor means progressing inward from a side of the housing; and

plural teeth fixed on said arbor means extending radially outwards therefrom, said teeth being laterally adjacent, angularly displaced with respect to each other to provide a helical tooth pattern extending the length of said arbor means, said teeth being interspersed with said grating members, each tooth having a distal shearing portion having a tip and a substantially flat stretch leading into a concave cutting surface immediately adjacent said arbor means;

said teeth and said grating member being constructed and arranged such that the tip moves past a grating member top surface before portions of the shearing portion located inward from the tip, thus to produce a shearing action forcing matter inward to the arbor means.

4,678,127

PUMPED FLOW ATTRITION DISK ZONE

Edward H. Cumpston, 6 Stonehedge Dr., Bennington, Vt. 05201

Continuation-in-part of Ser. No. 461,025, Jan. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 303,997, Sep. 21, 1981, abandoned. This application Oct. 10, 1984, Ser. No. 659,408

Int. Cl.[4] B02C *7/12*

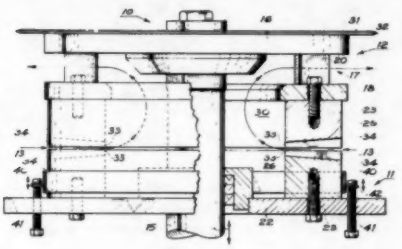
U.S. Cl. 241—46.04 **29 Claims**

1. In an attrition device having an attrition zone formed between a stator and rotor having annularly arrayed confronting bars contiguously separated by grooves, said attrition device being arranged within a tank of wetted and unpumpable fiber material that may contain contaminants, an improvement making said attrition zone self-cleaning while said attrition zone defibers said unpumpable material, said improvement comprising:

a. said rotor having a hollow interior that is enclosed between an inner periphery of said attrition zone and an annular discharge region;

b. impeller vanes arranged within said annular discharge

region to pump slurry from said hollow rotor interior radially outward through said discharge region and thereby to pull fiber clumps of said material into an outer periphery of said attrition zone, flow said fiber clumps radially inward through said attrition zone against the outward pumping force of said confronting bars, and draw said slurry from said inner periphery of said attrition zone through said hollow rotor to said discharge region;



c. radially outer ends of said bars on said rotor and stator at said outer periphery of said attrition zone lying in a cylindrical locus and presenting an interrupted cylindrical barrier to entry of said contaminants into said attrition zone; and

d. leading surfaces of said bars at said outer periphery being sloped to prevent fibers from wrapping around outer ends of said bars.

4,678,128

FIBER-BALE PLUCKER

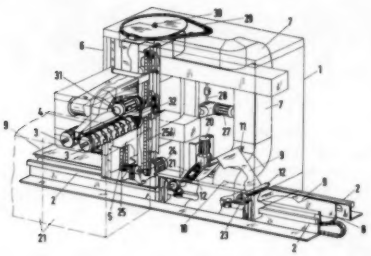
Hubert A. Hergeth, Kockerellstrasse 3, D-5100 Aachen, Fed. Rep. of Germany

Filed Jan. 24, 1986, Ser. No. 821,994

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503523

Int. Cl.[4] D01G *7/06*

U.S. Cl. 241—101 A **8 Claims**



1. In a fiber-bale mill comprising a cutting device which is movable along a row of fiber bales, means defining an upwardly open collector passage over which said cutting device travels back and forth and positioned parallel to said row of bales, fibers being drawn to said collector passage through an air passage in said cutting device, and a cover strip at least partially covering said collector passage, the improvement wherein an upper and a lower guide means for said cover strip are provided on said cutting device which lift said cover strip from said collector passage at a location at which said air passage opens into said collector passage, and guide said cover strip over a part of said air passage opening into said collector passage.

4,678,129

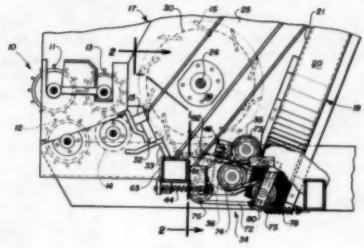
PADDLE WHEEL ASSEMBLY FOR FORAGE HARVESTERS

James F. Dallinger, Narvon, Pa., assignor to New Holland Inc., New Holland, Pa.

Filed Apr. 9, 1986, Ser. No. 849,669

Int. Cl.[4] B02C *21/02*

U.S. Cl. 241—101.7 **9 Claims**



1. In a forage harvester crop processor having means for cutting and chopping crop material, a compressor roll assembly for further conditioning crop material that has been previously cut and chopped by said cutting and chopping means, said compressor roll assembly including upper and lower compressor rolls arranged to condition crop material therebetween, one of said compressor rolls being removably mounted on support means which is movable to facilitate removal of said compressor roll from the forage harvester crop processor, and means for discharging crop material that has been further conditioned by said compressor roll assembly, the improvement comprising:

a paddle wheel assembly removably mountable on said support means for replacing said one compressor roll, said paddle wheel assembly including paddles for conveying cut and chopped crop material from said cutting and chopping means to said discharging means while causing only minimal further conditioning of the cut and chopped material.

4,678,130

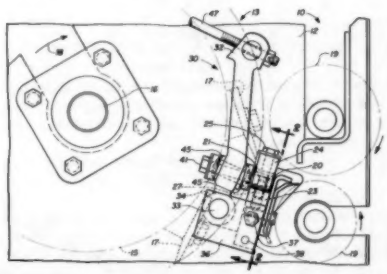
QUICK ADJUST SHEAR BAR MECHANISM

Wayne B. Martenas, Brugge, Belgium, assignor to New Holland Inc., New Holland, Pa.

Filed Oct. 4, 1985, Ser. No. 784,391

Int. Cl.[4] B02C *18/16*

U.S. Cl. 241—222 **14 Claims**



1. In an adjustable shearbar apparatus for a forage harvester having spaced opposing side sheets; an elongated shearbar having opposing sides and an elongated axis extending between opposing ends; lower support means for supporting the

shearbar, said lower support means being an elongated support member extending between and connected to said side sheets; upper clamping means associated with said lower support means for urging said shearbar against said lower support means adjacent opposite ends of said shearbar; a pair of levers pivotally movable relative to said elongated support member; connection means detachably affixing said shearbar to each of said levers; and means for pivoting said levers to move said shearbar linearly relative to said lower support means, said means for pivoting including an adjustment linkage coupled directly to said levers, the improvement comprising:

said connection means including a threaded fastener received through an opening extending through each said lever and threadably engaged with said shearbar, the pivotal connection between said levers and said elongated support member being located in an offset relationship relative to said shearbar axis; and

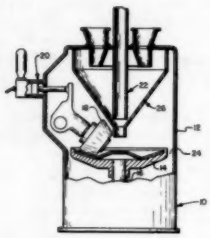
said upper clamping means being detachably connected to said lower support means by threaded members positioned in line with said shearbar axis, said shearbar being clamped between said upper clamping means and lower support means.

4,678,131

HIGHLY ABRASIVE RESISTANT MATERIAL

Arthur L. Rankin, III, Signal Mtn., Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 703,160, Feb. 19, 1985, Pat. No. 4,604,781.
This application Jan. 24, 1986, Ser. No. 822,095
Int. Cl.[4] B02C *4/30*
U.S. Cl. 241—293 **3 Claims**



1. In a pulverizer roll for a bowl mill including a body portion formed of a relatively soft, easily machinable material, the improvement comprising a highly abrasive surface formed on said body portion of an alloy having a compositon, by weight percentages, of 4.0–6.0% Carbon; 3.0–14.0% Manganese; 1.0–2.5% Silicon; 15.0–30.0% Chromium; 4.0–6.0% Molybdenum; and 0.5–2.0% Boron, the balance being essentially iron.

4,678,132

TRACTION DEVICE FOR LINE HANDLING EQUIPMENT

George A. Fowler, Dartmouth; James M. Hamilton, Halifax, and William J. Whiteway, Windsor Junction, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 13, 1986, Ser. No. 930,244
Int. Cl.[4] B65H *51/26*
U.S. Cl. 242—47.09 **3 Claims**

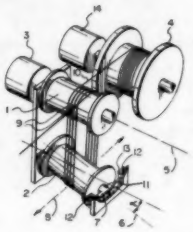
1. A traction device for line handling equipment comprising:

a first driven roller mounted with an axis of rotation parallel to the axis of rotation of a storage reel;

a second roller with an axis of rotation oriented at an angle to that of the first roller and within a second plane parallel to a first plane defined by the axis of rotation of the first roller;

said first and second rollers being operative to receive a plurality of wraps of a line and wherein said angle is selected to provide the desired wrap spacing on the rollers; and

slidable support means for the second roller allowing free displacement of the second roller axis within the second



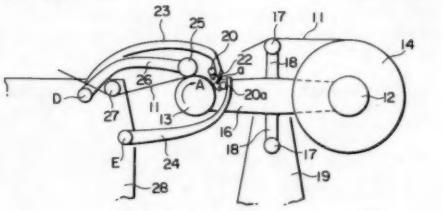
plane and in a direction generally normal to axis of rotation of the rollers, and operative to be displaced by the action of the line wraps seeking to maintain constant total wrap length while traversing back and forth across the rollers.

4,678,133

AUTOMATIC CUTTING AND WINDING APPARATUS FOR A WEB-LIKE MATERIAL SUCH AS A FILM

Tsutomu Suzuki, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1985, Ser. No. 799,736
Claims priority, application Japan, Nov. 30, 1984, 59-253090
Int. Cl.[4] B65H *19/20*
U.S. Cl. 242—56 A **4 Claims**



1. A turret type automatic cutting and winding apparatus for automatically cutting a continuous web as the web is maintained in pressing engagement against a rotating winding core by a press roller, and for wrapping the web around the rotating winding core, said apparatus comprising:

a frame;

a cutter for cutting the web across the entire width thereof, said cutter being movable to a position adjacent the winding core downstream from the press roller for cutting the web thereat to form a leading free end of the web;

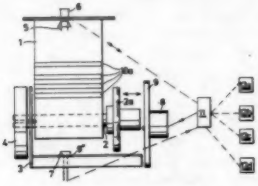
electrostatic charging means movable to a position adjacent the winding core downstream from the press roller for applying an electrostatic charge to the leading free end of the web such that the leading free end of the web is attracted to adhere against the winding core; and

swingable arm means pivotably mounted to said frame and on which said cutter and said electrostatic charging means are mounted, said swingable arm means pivoting between first and second positions to move said cutter and said electrostatic charging means to said positions adjacent the winding core respectively.

4,678,134
ARRANGEMENT FOR SAFETY BELT

Hanafi Ameur, Studenstaden 4, S-75233 Uppsala, Sweden

PCT No. PCT/SE84/00289, § 371 Date May 13, 1985, § 102(e) Date May 13, 1985, PCT Pub. No. WO85/01217, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 5, 1984, Ser. No. 734,269
Claims priority, application Sweden, Sep. 12, 1983, 8304319
Int. Cl.[4] B60R *22/38, 22/40*
U.S. Cl. 242—107.4 A 10 Claims



1. A safety belt arrangement for protecting passengers in motor driven vehicles, comprising:

at least one strap roller having a spindle mounted for rotation in a housing attached to the vehicle body;

at least one belt strap, one free end of which is attached to said spindle and which can be wound onto and unwound from said spindle;

biasing means urging said spindle to rotate so as to keep said belt strap wound onto said spindle;

locking means actuable for locking said spindle so as to prevent further unwinding of said belt strap;

at least one reference surface provided on said rotating spindle;

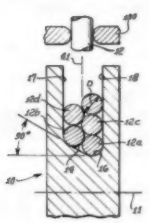
a detector which on unwinding of said belt strap senses said at least one reference surface at least once per revolution of said spindle and passes a signal to a memory means each time a reference surface is detected; and,

memory means arranged to register the time interval between the signals received from the detector and to determine the unwinding velocity of said belt strap, said memory means activating said locking means when a preselected value of the unwinding velocity is exceeded, thereby preventing further unwinding of said belt strap from said spindle.

4,678,135
CONTROL OF LINE WRAPPING ON REEL, BY REEL GROOVE DESIGN

Ralph W. Jones, 1025 Avondale Rd., San Marino, Calif. 91108

Filed Aug. 22, 1985, Ser. No. 768,204
Int. Cl.[4] B65H *75/14, 75/18*
U.S. Cl. 242—117 7 Claims



1. An apparatus for wrapping a line, the line having an average cross section dimension D, and including a reel having an axis of rotation, a hub outer surface extending about said axis, and two axially spaced flange surfaces which face one another, outwardly of the reel surface, and across a groove defined between said flange surfaces and outwardly of the hub surface, the improvement comprising:

(a) said groove having a width W, where $W=1.87\ D$,

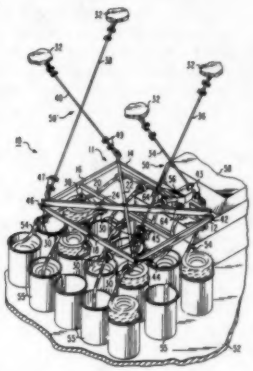
(b) said hub surface inclined relative to said axis to urge the line initial wrapping on the hub surface to a predetermined position,

(c) and including said line and a line guide aligning the line with and guiding the line toward the center of the groove as the line winds into said groove, the line guide defining an opening passing the line, said opening having width in the direction of W, and which is less than W and close to D.

4,678,136
SUSPENDED CREEL

Donald A. Cook, Gainesville, Ga., assignor to Coronet Industries, Inc., Atlanta, Ga.

Filed Jun. 16, 1986, Ser. No. 874,470
Int. Cl.[4] B65H *49/14, 57/06, 57/16*
U.S. Cl. 242—131 9 Claims



1. A suspended creel comprising:

a frame having a given weight;

a plurality of yarn guide elements secured to the frame; and

a plurality of wires of a given stiffness attached at one end thereof to the frame in spaced relation and adapted to be attached at the other end to an overhead support in spaced relation in crisscross fashion to suspend the frame from the support via the force of gravity, said wires each being secured to the frame structure at an angle of less than about 75° to the horizontal, the angle, wire stiffness and weight of the frame being such that the frame tends to resist swaying in response to an applied horizontal force caused by the friction engagement of yarns with the guide elements through which the yarns pass.

4,678,137
TAPE TRANSPORT APPARATUS

David W. Kincheloe, 417 North St., Graham, N.C. 27253

Filed Mar. 30, 1984, Ser. No. 595,405
Int. Cl.[4] G11B *15/32*
U.S. Cl. 242—192 9 Claims

1. A tape transport apparatus for delivering a tape at high speed and under a constant tension within a precise plane of tape travel, comprising:

(a) a rotatably mounted tape supply means;

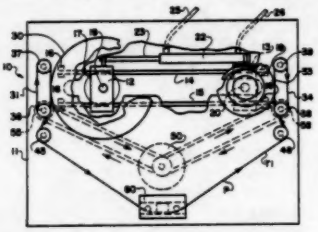
(b) a rotatably mounted tape take-up means;

(c) a first moving rim drive belt cooperating with said take-up means and including a guide for placing the moving tape onto said rim drive belt, said rim drive belt positioned

to carry the moving tape to the tape take-up means and apply it to the tape take-up means;

(d) drive means for rotating said tape take-up means;

(e) said guide comprising a roller having a crowned drive surface for centering the rim drive belt and the tape thereon during rotation thereof in the tape winding plane



of the tape take-up means for applying the tape precisely within the desired plane; and

(f) tape tensioning means for maintaining constant, predetermined tension on the tape, said tape tensioning means rotating said tape take-up means at a pre-determined, slightly faster surface speed than the speed at which the tape is being supplied thereto from said tape supply means.

4,678,138

MAGNETIC TAPE CASSETTE WITH REEL BRAKE MECHANISM

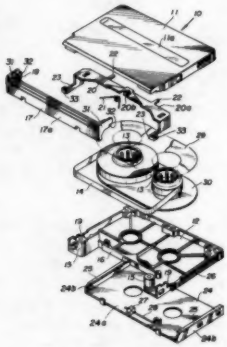
Tsuneo Nemoto, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,549

Claims priority, application Japan, Nov. 2, 1984, 59-167213[U]

Int. Cl.[4] G11B *15/22, 23/04*

U.S. Cl. 242—198 **11 Claims**



1. A magnetic tape cassette comprising:

a cassette casing housing a tape reel onto which a magnetic tape is wound;

a movable tape-protecting lid for selectably covering and exposing a front mouth of said casing, said tape-protecting lid having a side plate extending substantialiy parallel to side walls of said casing and pivoted thereon;

a reel brake disposed within said casing and movable between a reel brake state and a brake-release state, said reel brake being biased toward said reel brake state, in which it restricts rotation of said tape reels;

a first strip section integral with said side plate of said tape-protecting lid and movable between a first position corresponding to a closed position of said tape-protecting lid and a second position corresponding to an open position of said tape-protecting lid;

a second strip section integral with said reel brake and actuated in a first direction by said first strip to said reel brake state corresponding to said first position of said first strip and to said brake release state corresponding to said second position of said first strip; and

means for establishing interengagement between said first and second strips, said interengagement means comprising a recessed section on one of said first and second strips for retaining a complementary section of the other of said first and second strips for preventing relative displacement of the strips transverse to said first direction during interengagement of the strips.

4,678,139

RIBBON CASSETTES AND APPARATUS FOR RECEIVING SAME

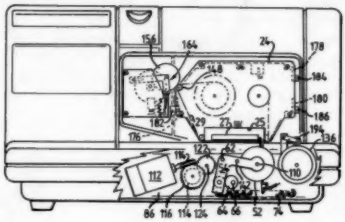
Alan Harry, Royston, England, assignor to PA Consulting Services Limited, London, England

Filed Jan. 14, 1986, Ser. No. 818,667

Claims priority, application United Kingdom, Jan. 19, 1985, 8501406

Int. Cl.[4] G11B *23/087;* **B41J** *35/28*

U.S. Cl. 242—199 **6 Claims**



1. A cassette and compartment for securably receiving said cassette, guide means for guiding the cassette during insertion into the compartment and retaining means for securing the inserted cassette, wherein spring means is located at the rear of the compartment having two mutually diverging resiliently displaceable arms one of which is engageable by the rearwardly advancing face of the cassette and the other of which is simultaneously engageable with a side wall of the cassette as said cassette is inserted into the compartment, and arranged whereby a force is applied by the said other arm of the spring means in a direction generally perpendicular to the direction in which the cassette is guided during insertion into the compartment, thereby on completion of said guided insertion to move the cassette in the said perpendicular direction into engagement with the said retaining means for securing the inserted cassette

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4,678,140

TAPE CASSETTE HAVING A MOUNTING FOR A LEG SPRING FOR A REEL BRAKE SPRING

Klaus Schoettle, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 25, 1985, Ser. No. 758,969

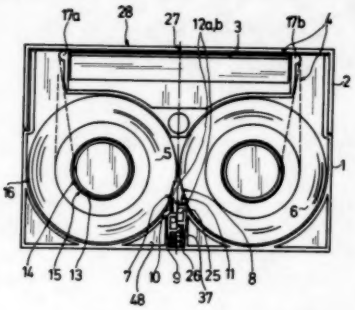
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 8422103[U]

Int. Cl.[4] G03B *1/04*

U.S. Cl. 242—199 **15 Claims**

1. A tape cassette, in particular a video tape cassette, having a housing with a mounting for a torsion spring, in particular for a reel brake system, including a brake element, in the tape cassette, said torsion spring including a generally cylindrical center section, forming an aperture therein, and two spring

arms extending from the two ends respectively of said center section, the center section of the torsion spring being attached to said brake element and the spring arms being supported on housing parts, which comprises a holding element has a cross-



sectional dimension which is at least slightly larger than the largest dimension of the aperture of the center section of the torsion spring, so that, after it has been mounted on the holding element, the spring is held, so that it cannot be lost, by radial tension acting on the center section.

4,678,141

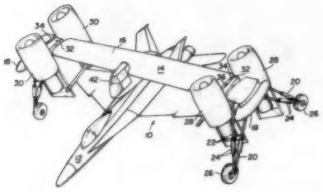
AIRCRAFT LAUNCHER AND RETRIEVER

August C. Sarrantonio, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 243,767, Mar. 16, 1981, abandoned. This application Aug. 4, 1986, Ser. No. 892,452

Int. Cl.[4] B64C *37/02*; B64D *5/00*

U.S. Cl. 244—2 **20 Claims**



1. A composite VTOL vehicle comprising:

a single aerodynamically shaped wing beam;

a left pair and a right pair of engines mounted respectively near the left and right outboard edges of the wing beam to straddle said wing beam, said engines including pivoting means by which the engines may be pivoted between a first position in which the engines provide substantially vertical thrust to each side of the wing beam and a second position in which the engines provide substantially horizontal thrust above and below said wing beam;

a centerline mounted cabin attached directly to the underside of the wing beam and positioned so that at least a portion thereof protrudes below said wing beam;

an attaching means for releasably attaching an aircraft to the underside of the cabin, said attaching means being adapted to attach the aircraft to be held thereby between the engine pairs; and

a landing gear means arranged in supportive deployment with respect to the vehicle.

4,678,142

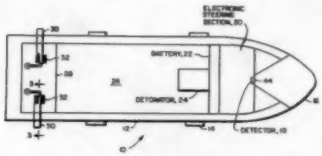
PRECISION GUIDED ANTIAIRCRAFT MUNITION

Tomas B. Hirschfeld, Livermore, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 25, 1985, Ser. No. 758,927

Int. Cl.[4] F42B *15/027*

U.S. Cl. 244—3.16 **1 Claim**



1. A guided projectile for use in an antiaircraft gun, a target aircraft being illuminated by a pulsing laser designator for said guided projectile to home upon, said guided projectile comprising:

a casing, said casing being aerodynamically shaped;

means for derotating and steering said guided projectile, said means attached to a rear section of said casing, said means including a plurality of steerable deployable vanes, said vanes being positioned in said rear section of said casing, said vanes causing said projectile to change from spin stabilized to drag stabilized;

optical means for focusing reflected laser radiation from said aircraft onto a designated area, a position of a spot, being the focused reflected laser radiation, on said designated area corresponding to a position of said aircraft in a field of view, said optical means being positioned at a front of said casing;

an electronic steering section, said electronic steering section outputting signals for controlling said vanes for derotating and steering said guided projectile, said signals being a function of said position of said spot on said designated area, said electronic section outputting signals to null said signals, said electronic steering section including a bridge cell having four detector quadrants forming said designated area, said bridge cell coupled to said optical means;

a vane control section, said vane control section receiving said signals from said electronic steering section, said vanes being driven by piezoelectric actuators that receive said signals;

a high energy exposive, said explosive positioned within said casing;

a detonator, said detonator causing said explosive to ignite upon predetermined conditions; and

a battery, said battery being activated upon the firing of said guided projectile, said battery providing power to said electronic steering section and said vane control section.

4,678,143

LAUNCHER FOR REMOTELY PILOTED AIRCRAFT

Dennis Griffin, Guildford, England, assignor to Frazer-Nash Ltd., England

Continuation of Ser. No. 539,983, Oct. 7, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 749,822

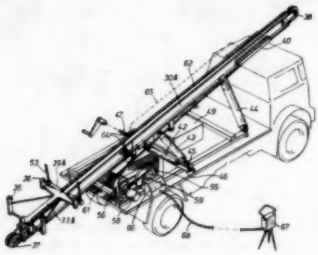
Claims priority, application United Kingdom, Dec. 17, 1982, 8235670

Int. Cl.[4] B64F *1/06*

U.S. Cl. 244—63 **15 Claims**

1. A launcher for launching a remotely piloted aircraft, comprising a transporter vehicle; a launch ramp mounted on said transporter vehicle and providing an inclined track; a carriage mounted on said launch ramp to travel along said inclined track; actuating means for accelerating said carriage with an aircraft to be launched thereon up said inclined track,

said actuating means including a flywheel disengageable driving connection between said flywheel and said carriage, and motor drive means for accelerating said flywheel up to an operational speed of rotation with said driving connections disengaged; a frictional holdback mechanism at the lower end of the launch ramp track to engage the carriage and restrain it



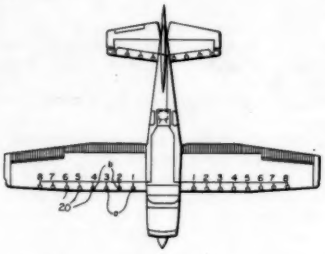
over a predetermined range of movement by a frictional holdback force at the commencement of launch and over the entire range of restraint as a decreasing function of distance traveled by said carriage whereby a predetermined force is developed to impel the carriage along the track; and frictional holdback force adjusting means to adjust the frictional force exerted by said holdback mechanism.

4,678,144

ELECTRO-IMPULSE DE-ICING SYSTEM FOR AIRCRAFT

Robert D. Goehner, Norwich; Norman I. Glover, Guilford, and Donald G. Hensley, Norwich, all of N.Y., assignors to Simmonds Precision, Tarrytown, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,056
Int. Cl.[4] B64D *15/16*
U.S. Cl. 244—134 R **7 Claims**



1. A method for de-icing an airfoil of an aircraft by means of a de-icing system having an energy storage means connected via a triggering means for energizing a plurality of electromagnetic coil sets arranged in a linear array under the leading edge of said airfoil for a given span thereof, comprising the steps of

sequentially selecting interlocking groups of said coil sets for being energized, each of said groups occupying a portion of said span of said airfoil, whereby said interlocking groups are progressively energized along said span of said airfoil,

simultaneously energizing said coil sets in each of said groups when sequentially selected, including

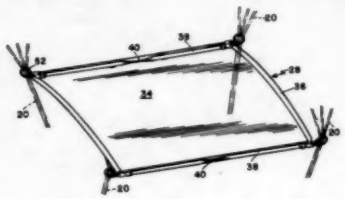
triggering each of said coil sets twice from 3 to 5 seconds apart during said energizing step.

4,678,145

REMOVABLE SLIDER FOR PARACHUTE DEPLOYMENT

Robert J. Buehrer, Whittier, and William L. B. Gargano, Davis, both of Calif., assignors to FXC Corporation, San Diego, Calif.

Filed Jul. 26, 1985, Ser. No. 759,609
Int. Cl.[4] B64D *17/62*
U.S. Cl. 244—152 **13 Claims**



5. In combination,

a parachute having a canopy and a plurality of longitudinally extending suspension lines; and

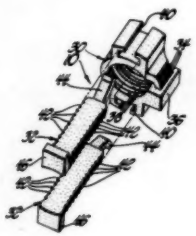
manually releasable means for restraning the suspension lines to control the rate of inflation of the canopy during the deployment thereof, including a panel, a pluraltiy of rings each surrounding and slidable longitudinally over a corresponding set of the suspension lines, and a plurality of tear away connectors for coupling the panel to corresponding ones of the rings.

4,678,146

UNIVERSAL GROMMET RETAINER

Robert G. Plyler, Vienna, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1985, Ser. No. 804,619
Int. Cl.[4] F16L *5/00*
U.S. Cl. 248—56 **3 Claims**



1. A grommet assembly attachable to a panel having opposed surfaces to pass a wire bundle through an aperture in said panel, said grommet assembly comprising,

a grommet body adapted to hold said wire bundle fast as it extends through said grommet body, and also including a stop portion engageable with one surface of said panel when said grommet body has been placed in an attachment position with said wire bundle passing through said aperture,

a universal retainer, said retainer including a gripper member structurally separate from said grommet body and adapted to be clamped around said wire bundle at a location spaced from the other surface of said panel,

said retainer further including at least one biasing member slideably movable relative to said gripper member when said gripper member is clamped to said wire bundle, said biasing member having a contact portion engageable with said panel other surface as said biasing member moves relative to said clamped gripper member toward said panel other surface, and

latch means operative between said biasing member and said gripper member to prevent said contact portion from moving away from said panel other surface when said contact member has engaged said panel other surface,

whereby, when said biasing member is moved relative to said clamped gripper member toward said panel other surface, said biasing member contact portion engages said panel other surface, thereby biasing said clamped gripper member away from said panel other surface and pulling on said wire bundle to draw said grommet body stop portion into tighter engagement with said panel one surface, said grommet body stop portion and said biasing member contact portion being maintained in engagement with their respective panel surfaces by said latch means, said structurally independent universal retainer thereby cooperating with said grommet body to attach said grommet assembly to said panel.

4,678,147

CLAMPS FOR ATTACHING PIPELINES TOGETHER IN PARALLEL RELATIONSHIP

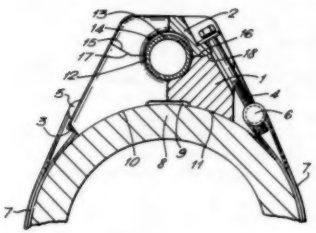
John R. Barnes, Surbiton; John E. Diamond, London, and Graham J. Griffin, Binfield, all of United Kingdom, assignors to Conoco Inc., Ponca City, Okla.

Filed Aug. 15, 1985, Ser. No. 766,602

Claims priority, application United Kingdom, Aug. 17, 1984, 8421027

Int. Cl.⁴ F16L *3/08*

U.S. Cl. 248—74.1 **12 Claims**



1. A clamp for use in mounting a line of smaller diameter on a line of larger diameter which comprises a saddle for positioning on the line of larger diameter, a channel formed in an outer face of the saddle for receiving the line of smaller diameter, a closure member mountable on the saddle to close the channel around the line of smaller diameter, a strap for passing around the line of larger diameter, connectable to opposite sides of the closure member and at least two tensioning devices connectable between the respective ends of the strap and the opposite side of the closure member and tensionable around the line of larger diameter whereby in use the saddle is pressed against the line of larger diameter and the closure member is pressed against the saddle as the tensioning devices are tensioned, wherein the tensioning devices are bolts which are provided at their ends with tee-bars for attachment to the strap and which in use pass through bolt holes or slots on either side of the closure member.

4,678,148

SUPPORT ARRANGEMENT FOR FACILITATING A FASTENING OF WALLS, PARTITION ELEMENTS AND SHOW CASES

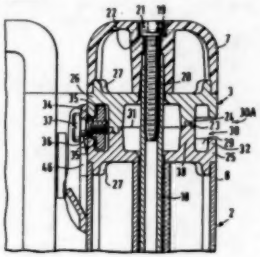
Klaus Winn, Giessen, and Erich Otto, Burbach, both of Fed. Rep. of Germany, assignors to Weyel KG, Haiger, Fed. Rep. of Germany

Filed Oct. 21, 1985, Ser. No. 789,475

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438343

Int. Cl.⁴ F16L *3/00*

U.S. Cl. 248—122 **11 Claims**



1. In a support arrangement, in particular for fastening of walls, adjustable walls, partition wall elements, boards, which are built of individual pipe sections, the improvement comprising wherein between two of said pipe sections there is inserted an intermediate piece, wherein said intermediate piece is provided with an annular recess for receiving of fastening elements therein, wherein all said pipe sections and said intermediate piece are guyed against one another by a pull rod which extends through all thereof, said intermediate piece being provided with annular shoulders on each side which cooperate with an inner wall of said pipe sections, and wherein recesses are provided in said annular shoulders, into which recesses are received webs provided on the inside of said pipe sections.

4,678,149

SUPPORT

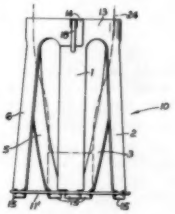
Geoffrey S. Chase, 17 High Street, Criccieth, Gwynedd LL52 OBS, England

Filed Sep. 10, 1985, Ser. No. 774,536

Claims priority, application United Kingdom, Sep. 21, 1984, 8423951

Int. Cl.⁴ A47G *23/02*

U.S. Cl. 248—150 **9 Claims**



1. A support comprising a slotted base portion and an originally flat, open-topped wall portion, the wall portion comprising a web and a plurality of tongues, each tongue having a root and a free end, the tongues being commonly joined at their roots by said web, the web being bendable to make a cage-like enclosure of the tongues, means to connect together opposite ends of the web when the web is bent into an annular configuration to make said enclosure, the base slots being arranged to

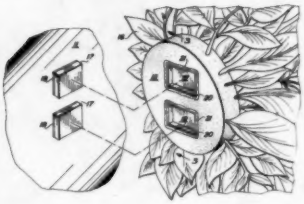
receive respective free end portions of at least some of the tongues so that the cage-like enclosure is upstanding from the base and each said at least some tongues having a formation spaced from the free end thereof to engage the associated slot whereby said free end portions provide feet for the support beneath the base.

4,678,150

DETACHABLE FOAM-BORNE MOUNTING METHOD

Lola Newman, and Joseph Zelasko, both of 1613 W. Carol Ave., Mesa, Ariz. 85202

Filed Oct. 6, 1986, Ser. No. 915,978
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—205.3 **20 Claims**



1. A detachable foam-borne mounting method comprising the steps of:

(a) providing a penetrable rigid foam base, said penetrable rigid foam base having a display surface, said penetrable rigid foam base having a rear surface thereupon obverse said display surface, said rear surface having at least one shield-engagement cavity;

(b) injecting into each said shield-engagement cavity a first adhesive, said penetrable rigid foam base insoluble in said first adhesive;

(c) providing shield means, said shield means having indexing means, said shield means insoluble in said first adhesive;

(d) inserting into each said shield-engagement cavity said shield means, said first adhesive intermediately adhering said shield means to said penetrable rigid foam base within said shield-engagement cavity, said shield means conformal said shield-engagement cavity, said shield means having at least one mount-engagement cavity therein obverse said shield-engagement cavity;

(e) injecting into each said mount-engagement cavity a second adhesive, said shield means insoluble in said second adhesive;

(f) providing first mount means corresponding to each said shield means, said first mount means insoluble in said second adhesive;

(g) inserting into each said mount-engagement cavity the corresponding said first mount means, said second adhesive intermediately adhering said first mount means to said shield means within said mount-engagement cavity, said first mount means conformal said mount-engagement cavity;

(h) providing one of second mount means corresponding to each said first mount means, said second mount means detachably mateable to the corresponding said first mount means, said second mount means non-rotatingly indexable to one of the corresponding said shield means and the corresponding said first mount means;

(i) providing a display surface;

(j) penetratingly affixing display matter to said penetrable rigid foam base;

(k) releasably matingly indexingly joining each said first mount means to each corresponding said second mount means;

(l) applying onto at least one of said display surface and said second mount means a third adhesive means, said display surface insoluble in said third adhesive, said second mount means insoluble in said third adhesive means;

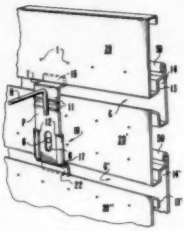
(m) emplacing said second mount means at a desired location upon said display surface, said third adhesive affixingly intermediate said second mount means and said display surface.

4,678,151

MERCHANDISE HANGER FOR SLOTTED WALL DISPLAY PANEL

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Continuation-in-part of Ser. No. 626,532, Jun. 29, 1984, Pat. No. 4,607,753. This application Apr. 9, 1986, Ser. No. 849,848
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—220.2 **6 Claims**



1. A hanger support for displaying small articles of merchandise on a generally planar slotted wall merchandise display panel having horizontal grooves between opposed edges of adjacent slats forming the wall, comprising

(a) an assembly of a length approximately the height of the slats adapted to be detachably connected to a first slat at any point along the length thereof and having a cantilever hanger projecting forwardly therefrom for supporting and displaying the small articles of merchandise,

(b) said assembly comprising a main plate having said hanger affixed to the front face of said plate and a first offset retaining flange bent rearwardly from one end thereof and adapted for insertion into a first groove adjacent to said slat for ultimate disposition in a plane substantially parallel to said slat and in engagement with the rear portion of a second slat adjacent to said first slat,

(c) an auxiliary plate spanning the entire width of the rear face of said main plate and mounted for slideable movement thereon adjacent to the end thereof remote from said first flange,

(d) cooperating means on said plates for limiting the extent of the sliding movement therebetween, and

(e) secondary retaining means on the free end of said auxiliary plate adapted for insertion into a second groove adjacent to the opposite edge of said first slat for engagement with the rear portion of a third slat adjacent to and beyond said second groove.

4,678,152

APPARATUS FOR SUPPORTING OR ERECTING STRUCTURES

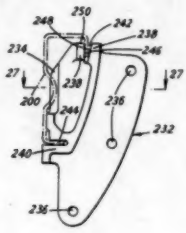
Eric K. Cheng, London, United Kingdom, assignor to Reyloc Limited, London, United Kingdom

Filed Sep. 21, 1984, Ser. No. 652,975
Claims priority, application United Kingdom, Oct. 6, 1983, 8326708; Jun. 28, 1984, 8416500
Int. Cl.[4] E04F *19/06*
U.S. Cl. 248—225.1 **6 Claims**

4. An apparatus for supporting or erecting structures comprising a bracket which engages an elongated linear support,

said elongated linear support member having a vertical support member web and a horizontal support member web, said horizontal support member web having a vertical, downwardly extending flange and said vertical support member web having a horizontal extending flange,

said bracket having a first blade portion and a main body portion, said main body portion having first and second body webs extending laterally of said first blade portion, said first and second body webs each having walls defining respective first and second notches,



said first body web presenting a substantially flat surface in an upward direction and said first notch being defined by a vertical wall and an inclined wall, such that said vertical, downwardly extending flange extends into said first notch when said bracket engages said elongated linear support,

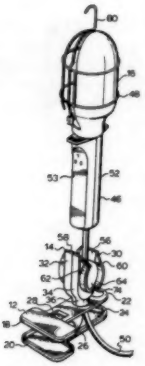
said second body web presenting a substantially flat surface in an outward direction and said second notch being defined by a pair of walls of which at least one is substantially horizontal, such that said horizontally extending flange extends into said second notch when said bracket engages said elongated linear support.

4,678,153

TROUBLE LAMP AND RETAINER

William H. Maddock, Markham, and Bert Bobrovniczky, Don Mills, both of Canada, assignors to Noma Inc., Scarborough, Canada

Filed Nov. 4, 1985, Ser. No. 795,008
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—229 **14 Claims**



1. A retainer for a trouble lamp having an elongated handle comprising:

a holder including a pair of spaced apart elongated jaws extending about a first central axis and connected at one axial end thereof by a bight portion, said jaws defining a first pair of opposed axially aligned substantially concave bearing surfaces and a second pair of transversely aligned opposed substantially concave bearing surfaces located about a second central axis extending transverse to and intersecting said first central axis intermediate the axial ends thereof for receiving and retaining the handle of said trouble lamp therebetween in either an axially aligned or a traversely aligned position, and;

a clamp member;

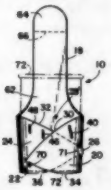
one of said clamp member and the bight portion of said holder being provided with a journal and the other a bearing for said journal to thereby connect said clamp member and said holder for relative axial rotation.

4,678,154

HOLDER FOR BEVERAGE CONTAINERS AND THE LIKE

Joseph R. McFarland, 507 Palo Alto Dr., Vancouver, Wash. 98661

Filed Apr. 25, 1986, Ser. No. 856,593
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—311.2 **15 Claims**



1. A holder for beverage containers and the like, of flexible sheet material having a generally three-armed shape when flat, comprising:

(a) a first arm having a distal portion and a proximal portion;

(b) a second arm extending laterally with respect to said first arm and being connected with said proximal portion of said first arm, said second arm having a hook portion;

(c) a third arm extending generally oppositely away from said second arm and being connected with said proximal portion of said first arm, said third arm including a tapered tongue portion extending away from said second arm;

(d) first slot means defined in said second arm for adjustably receiving said tapered tongue portion therein; and

(e) second slot means defined in said third arm for selectively receiving and holding said hook portion of said second arm with said second and third arms configured to encircle a beverage container as a generally frusto-conical receptacle in a selected one of a plurality of sizes.

4,678,155

MECHANISM ON A VEHICLE SEAT FOR ADJUSTING STIFFNESS OF RIDE

John W. Carter, Moline, Ill., assignor to The Wise Company, Inc., Memphis, Tenn.

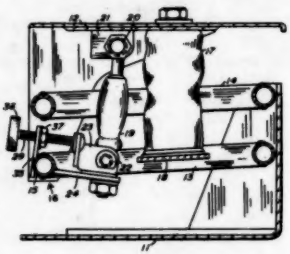
Filed Dec. 12, 1986, Ser. No. 941,201
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—564 **2 Claims**

1. A suspension for a vehicle seat, said suspension having first and second supporting members spaced apart, said first supporting member being a support for said seat, said second supporting member being a base to be attached to a vehicle, each of said supporting members having a pair of pivots, first and second links connected between said supporting members, the ends of said links being connected to respective ones of said pivots to provide parallel linkage, a resilient member connected to said parallel linkage to support said first supporting member at a desired height, a shock absorber positioned apart from said resilient member and connected between any one of said supporting members and any one of said links, one end of

said shock absorber being connected to said any one supporting member and the other end of said shock absorber being connected to said any one link at a position approximate a respective one of said pivots connected to said any one link, the improvement comprising:

an adjustable assembly connecting said other end of said shock absorber to said any one link, said adjustable assembling comprising:

a plate connected to said any one link, the position of said plate being approximate said respective pivot connecting said any one link to said any one supporting member, a surface of said plate facing said any one supporting member and being substantially normal to a line directed to



said one end of said shock absorber, said surface extending a moderate desired distance along the length of said any one link,

a slide positioned on said surface of said plate and restricted to move a moderate desired distance over said surface along a line directed from said respective pivot thereof in a plane substantially parallel to said any one link,

means pivotally connecting said other end of said shock absorber to said slide, and

adjusting means for setting said slide along said line within said moderate desired distance to control quality of ride without changing said desired height of said first supporting member for said seat.

4,678,156

REUSABLE CONCRETE FORMS WITH SPACER/TIERODS

Joseph Scalamandre, Freeport, and John J. Vigilante, Glendale, both of N.Y., assignors to Fred Scalamandre, Freeport and Michael L. Vigilante, Massapequa Park, both of, N.Y., a part interest

Filed Dec. 31, 1984, Ser. No. 687,834
Int. Cl.[4] E04G *17/12*
U.S. Cl. 249—34 **21 Claims**

1. A reusable form, for in situ construction of poured concrete, the form comprising a plurality of sections each having a sheet-like structure stiffened by a peripheral frame and spacer/tie means holding opposing form sections in a spaced relationship, the spacer/tie means comprising:

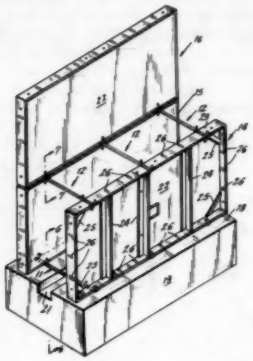
an elongated main portion;

first and second indexing formations on said main portion at opposite ends thereof, and third and fourth indexing formations on said main portion at fixed locations along the length thereof with said locations being a predetermined distance inboard of the respective first and second indexing formations;

said predetermined distance being substantially equal to the thickness of a section of the frame and the distance between the third and fourth indexing formations being equal essentially to the thickness of a wall to be poured;

said first and second indexing formations being tool bendable with respect to said main portion;

said first and second formations extending from said main portion inwardly toward one another and over the frames of a first pair of opposing form sections, firmly holding



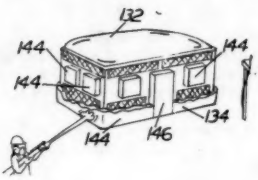
said first pair of form sections against vertical movement with respect to said main portion.

4,678,157

APPARATUS FOR THE CONSTRUCTION OF A LOW COST STRUCTURE

Robert Fondiller, 200 W. 58th St., New York, N.Y. 10019

Filed Aug. 30, 1984, Ser. No. 645,802
Int. Cl.[4] B28B *7/32*; B29C *41/08*; E04B *1/34*; E04G *11/02*
U.S. Cl. 249—65 **9 Claims**



1. An apparatus for the rapid construction of structures comprising an inflatable member having a plurality of integrally formed outwardly projecting protuberances with said protuberances inflateable along with said inflateable member, means for inflating said inflatable member, hardenable material, and means for applying said hardenable material to said inflatable member in areas between said protuberances thereby forming a shell structure with said protuberances forming apertures in said shell structure.

4,678,158

INJECTION MOLD INCLUDING MOLD SIDEWALL LOCKING BARS

Robert E. Brock, Mukwonago, Wis., assignor to Triangle Tool Corporation, Brookfield, Wis.

Filed Nov. 21, 1985, Ser. No. 802,353
Int. Cl.[4] B29C *45/33, 39/34*
U.S. Cl. 249—161 **13 Claims**

1. A mold assembly comprising

a first mold plate,

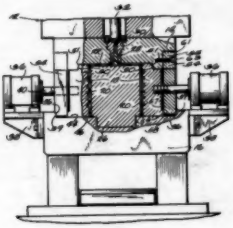
a second mold plate,

means for supporting said first and second mold plates for movement toward and away from each other between a mold open position and a mold closed position,

a plurality of mold sidewalls positioned between said first

mold plate and said second mold plate, said sidewalls being moveable in a direction generally transverse to the direction of movement of said first and second mold plates with respect to each other and between a mold open position and a mold closed position wherein said sidewalls define a mold cavity, said sidewalls each including a first portion adjacent said first mold plate and a second portion adjacent said second mold plate, and

means for locking said mold sidewalls in said mold closed position, said means for locking including a locking bar



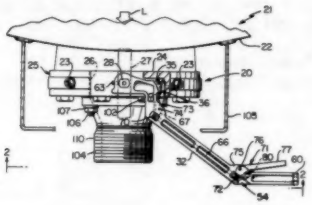
having opposite ends, one of said ends being fixed to said first mold plate and the other of said opposite ends of said locking bar extending toward said second mold plate and being wedged between said second portion of one of said sidewalls and a portion of said second mold plate when said first and second mold plates are in said mold closed position and when said sidewalls are in said mold closed position and to prevent outward movement of said second portion of said one of said sidewalls with respect to said second mold plate.

4,678,159

MANUALLY ACTUATED FLUID FLOW CONTROL VALVE AND METHOD OF MAKING SAME

John F. Gardner, Loveland, and Gerald H. Morton, Cincinnati, both of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed May 14, 1985, Ser. No. 733,964
Int. Cl.[4] F16K *35/02*
U.S. Cl. 251—107 **18 Claims**



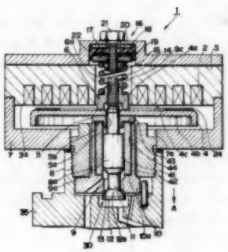
1. In a manually actuated fluid flow control valve assembly which has an associated support structure, said valve assembly comprising, a valve body having a flow passage therethrough, a closure device carried by said valve body for controlling fluid flow through said passage, a manually operated handle operatively connected to said closure device, said handle being manually movable between an open and a closed position thereof which also define an open and a closed position of said closure device and hence said valve assembly, and manually releasable means for holding said handle in said closed position, said manually releasable means comprising automatic lock means carried by one of said structure and said handle for engaging the other of said structure and said handle for providing automatic locking of said handle once said handle and said closure device are in said closed position, said automatic lock means comprising spring lock means, the improvement in which said spring lock means is in the form of a yieldable spring clip having a substantially U-shaped configuration defined by a bight having a pair of legs diverging therefrom, one of said legs being fastened to said one of said structure and said handle and the other of said legs having a projection which extends away from both of said legs, and said projection being adapted to yieldingly engage said other of said structure and said handle and provide said automatic locking of said handle.

4,678,160

SOLENOID VALVE

Keiichi Yamada, and Tatsuhiko Abe, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 885,145
Claims priority, application Japan, Jul. 18, 1985, 60-157049
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.02 **8 Claims**



1. A solenoid valve which has a valve member made of an electrically conductive material and an electrically conductive body having a valve seat associated with said valve member, thereby constituting a switch for electrically connecting said electrically conductive body with said valve member when said valve member is seated on said valve seat, said solenoid valve comprising:

a solenoid actuator which has a stator with an exciting coil and an armature fixed to said valve member and provides an electromagnetic force to seat said valve member on said valve seat;

a spring means for biasing said valve member to separate from said valve seat at the time said solenoid actuator is in the de-energized state;

a stopper connected to said valve member for determining the maximum stroke of said valve member for the opening state of said solenoid valve; and

an insulating guide member having a guide hole for supporting and guiding said valve member while maintaining an electrically insulating state between said body and a sliding surface of said valve member, said insulating guide member being mounted on the body in such a way that said stopper comes in contact with only one of the end portions of said insulating guide member when said solenoid actuator is in the de-energized state and this end portion is acting as an electrically insulating stopping member for said stopper.

4,678,161

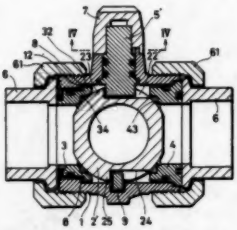
BALL VALVE

Yoshiaki Bando; Teruyoshi Asano; Shigenobu Kato, all of Saitama, and Katsuhiko Tanioka, Shiga, all of Japan, assignors to Seikisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 660,182, Oct. 12, 1984, abandoned. This application Aug. 7, 1986, Ser. No. 893,448

Int. Cl.[4] F16K *25/00, 5/06*

U.S. Cl. 251—171 **5 Claims**



1. In a ball valve in which a ball is arranged in a valve body in such a manner as to selectively open and close a fluid passage in said body, and annular seals abut against said ball from both sides in said fluid passage, said annular seals being pushed towards said ball by a first and a second seal carrier, the improvement wherein:

said first seal carrier having a continuous flange formed on the periphery of one end adjacent said ball, said flange being locked to a step which is formed on an inner surface of one end of said valve body and a flat inner surface at the other end, said second carrier having a flat surface at its end adjacent said ball confronting said flat surface on said valve body on an inner surface of one end of said valve body, wherein a reaction biasing force is generated when said ball is forced against said first seal carrier, and wherein said reaction force maintains the seal between both of said seal carriers and said ball.

4,678,162

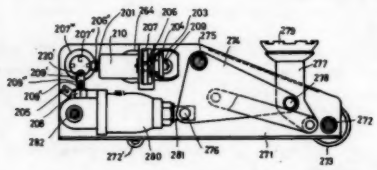
JACK HAVING THE PNEUMATIC AIR PUMP FUNCTIONS AND USING A COMMON DRIVE MOTOR

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Oct. 25, 1985, Ser. No. 791,503

Int. Cl.[4] B60P *1/48;* **B66F** *3/24*

U.S. Cl. 259—8 B **1 Claim**



1. In a hydraulic floor jack adapted for the tasks of lifting a vehicle and pumping up a tire, respectively, the combination of a housing, a common drive motor in the housing, the motor including an elongated double-ended shaft having respective end portions projecting from the motor, an air pump on the housing and including a piston connected to one of the end portions of the motor shaft, reduction gearing driven by the other end portion of the motor shaft, an oil pump including a crank driven by the reduction gearing, an oil pressure tank driven by the oil pump and including a drive rod, a lifting mechanism including a pivoted arm set driven by the drive rod, a pivoted upper arm coupled to the arm set and including a supporting block for lifting a vehicle, and drain control means for the air pump and oil pump, respectively.

4,678,163

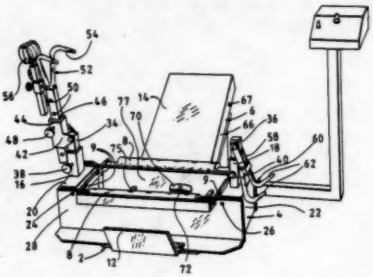
TIRE HANDLING APPARATUS

Arne Hjorth-Hansen, Virringvej 2, DK-8660 Skanderborg, Denmark

Continuation of Ser. No. 707,031, Mar. 1, 1985, abandoned. This application Sep. 18, 1986, Ser. No. 908,781

Int. Cl.[4] B60C *25/14*

U.S. Cl. 254—50.2 **10 Claims**



1. A tire handling apparatus of a tire spreader type, the apparatus comprising a support member for receiving and supporting a tire in an upright position thereof, said support member including tire spreading claw means operable to be brought into engagement with an inside of opposed tire bead areas and to draw such opposed bead areas away from each other for facilitating access to an interior of the tire with the latter located in a convenient working height upon elevation of the tire from a floor supporting the apparatus; wherein the support member is a unit of a height dimension substantially smaller than said convenient working height; wherein the support member is associated with an underlying, floor supported lower apparatus part through a lift system operable to automatically raise and lower the support member between a lower tire receiving position and an elevated working position upon an actuation of the lift system; and wherein the spreading claw means are operated during a raising movement of the lower apparatus part by said lift system so as to support the tire in an upright position.

4,678,164

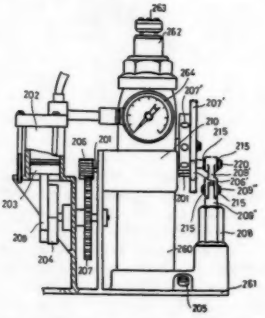
JACK HAVING THE PNEUMATIC AIR PUMP FUNCTIONS AND USING A COMMON DRIVE MOTOR

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Continuation-in-part of Ser. No. 791,503, Oct. 25, 1985, abandoned. This application Jan. 8, 1986, Ser. No. 817,245

Int. Cl.[4] B66F *3/24;* **B60P** *1/48*

U.S. Cl. 254—93 H **1 Claim**



1. In a hydraulic jack including an air pumping feature, the combination of a base, a main body on the base, a common drive motor in the body transversely thereof, the motor includ-

ing an elongated double-ended shaft having respective end portions projecting from the motor, an air pump in the body and including a piston, first reduction gearing connected between the piston and one of the end portions of the motor shaft, second reduction gearing driven by the other end portion of the motor shaft, an oil pump driven by the second reduction gear, a lifting mechanism including a stand shaft driven by the oil pump, a top block driven by the stand shaft for lifting a base, and drain control means for the air pump and oil pump, respectively.

4,678,165

MODE OF CONSTRUCTION OF LIFTING MECHANISMS FOR A JACK-UP PLATFORM AND LIFTING MECHANISM FOR A JACK-UP PLATFORM

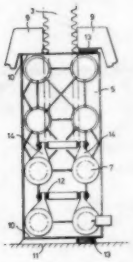
Jarmo Eloranta, Parkano, Finland, assignor to Rauma-Repola Oy, Parkano, Finland

Filed May 6, 1986, Ser. No. 860,242

Claims priority, application Finland, May 27, 1985, 852112; Mar. 26, 1986, 861311

Int. Cl.[4] B66F *7/12*

U.S. Cl. 254—97 **10 Claims**



1. A lifting mechanism for a jack-up platform comprising a platform, a platform support frame for supporting said platform and at least one leg for supporting said platform support frame, said leg having a toothed rack extending therealong, said platform support frame being movable relative to said at least one leg, said lifting mechanism comprising:

a lifting frame, adjacent said at least one leg and movable relative thereto, connected to said platform support frame; and

lifting means, connected to said lifting frame and engaging said toothed rack, for moving said lifting frame relative to said leg;

wherein said lifting means comprises:

two cog wheels engaging said toothed rack, said cog wheels being rotatable so as to move along said toothed rack;

first gear box means for one of said cog wheels, having a first torque arm to transmit torques produced by said one of said cog wheels moving along said rack, for rotating said one of said cog wheels in response to a first rotational force;

first motor means, operably associated with said first gear box means, for providing said first rotational force;

second gear box means for the other of said two cog wheels, having a second torque arm to transmit torques produced by said other of said cog wheels moving along said rack, for rotating said other of said cog wheels in response to a second rotational force;

second motor means, operably associated with said second gear box means, for providing said second rotational force;

wherein said first and second torque arms are interconnected so that the torques produced by the cog wheels compensate for each other.

4,678,166

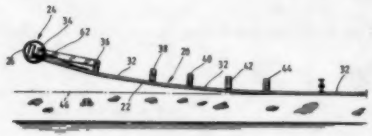
ECCENTRIC LOADER GUARDRAIL TERMINAL

Maurice E. Bronstad, San Antonio, Tex.; James H. Hatton, Jr., Washington, D.C., and Leonard C. Meczkowski, Herndon, Va., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 24, 1986, Ser. No. 855,852

Int. Cl.[4] E01F *15/00*

U.S. Cl. 256—13.1 **6 Claims**



1. An eccentric loader guardrail terminal for use at the upstream end of a guardrail comprising,

a plurality of joined together horizontally extending W-beam guardrails,

a plurality of vertical supports for vertically supporting said W-beam guardrails, said vertical supports are breakaway posts,

said plurality of rails flaring away from the traffic side of the guardrail in an upstream direction, and

an eccentric lever means connected to the upstream end of the plurality of rails whereby an impacting vehicle at the upstream end will facilitate buckling of the rails allowing the vehicle to pass behind the terminal.

4,678,167

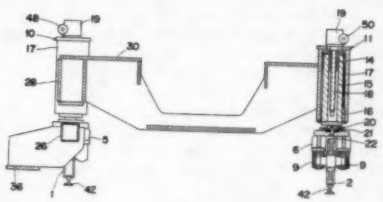
TUNDISH CAR IN A CONTINUOUS CASTING ASSEMBLY

Herbert Lemper, McMurray, Pa., assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 26, 1986, Ser. No. 833,112

Int. Cl.[4] C21B *3/10*

U.S. Cl. 266—165 **8 Claims**



1. A tundish car in a continuous casting assembly, comprising:

a lifting main frame for supporting a tundish;

first and second wheel support frames for supporting a pair of front wheels and a pair of rear wheels;

a plurality of lift mechanisms respectively mounted above said wheel support frames and connected to said lifting main frame;

means for rigidly interconnecting a first and second lift mechanism of said plurality of lift mechanisms; and

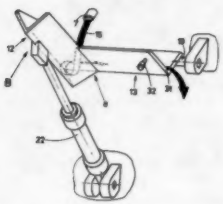
a spherical plate fixed to a bottom portion of at least one of said plurality of lift mechanisms and a spherical seat provided on at least one of said wheel support frames wherein said at least one of said plurality of lift mechanisms is supported on said spherical seat by engagement of said spherical seat with said spherical plate.

4,678,168

TILTING CHANNEL ARRANGEMENT FOR GUIDING A MOLTEN MATERIAL

Bernhard Enkner; Leopold Amon, both of Linz; Alfred Kübelböck, Zwettl/Rodl; Wolfgang Trimmel, Leoben; Paul Nalepka, Niklasdorf; Leopold Schropp, Linz; Helmut Schwaighofer, Neumarkt; Reinhard Pum, Linz; Manfred Traxler, Hart, and Franz Tasch, Bad Mitterndorf, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 13, 1985, Ser. No. 775,536
Claims priority, application Austria, Sep. 18, 1984, 2965/84
Int. Cl.[4] F27D *3/15*
U.S. Cl. 266—196 **12 Claims**



1. A tilting channel arrangement for guiding a stream of molten material as it is being discharged from a tap hole in the side of a metallurgical vessel, said tilting channel arrangement having two branches extending divergently at an angle of less than 180° from a common origin to respective outlet ends, each branch consisting of a linear channel, one of said branch channels having a bottom which, when said branch channel is positioned for conveying said material away from said origin to its outlet end, is located at a lower level than the bottom of said other branch channel, said tilting channel arrangement being provided with a tiltable mount for securing the tilting channel arrangement in a first position beneath said tap hole with said one branch channel having its longitudinal axis aligned with the plane of the trajectory of said material when issuing from said tap hole and with said origin located beneath said tap hole for receiving issuing material at a point of impact in the vicinity of said origin, said tiltable mount being constructed to provide a tilting axis about which said tilting channel arrangement can be rotated selectably from said first position to a second position where said outlet end of said one branch channel is elevated sufficiently to cause any material that issues from said tap hole to accumulate in the vicinity of said point of impact and enter said other branch channel which has moved into position for conveying said material toward its said outlet end.

4,678,169

PRINTED CIRCUIT BOARD HOLDER

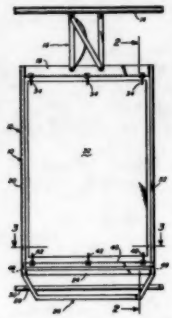
Herbert Fishman, Newton Center, and Alvin J. Rogers, Brockton, Mass., assignors to Systems Engineering & Manufacturing Corp., Stoughton, Mass.

Continuation of Ser. No. 565,860, Dec. 27, 1983, abandoned, which is a continuation-in-part of Ser. No. 455,956, Jan. 6, 1983, Pat. No. 4,454,003. This application Jul. 7, 1986, Ser. No. 882,182
Int. Cl.[4] B23Q *1/00*
U.S. Cl. 269—46 **14 Claims**

1. In a frame for use in conveying at least one substantially planar printed circuit board component in a vertical plane along a path for treatment of sides of said board, said frame defining a rigid frame support and means for mounting said frame for movement along said path, the improvement comprising;

means for mounting an edge of said board at a first position on said frame,

a moveable weight bar means for mounting a second edge of said board at a second position on said frame below said first position with said weight bar acting to provide a gravitational force on said board component for aiding in maintaining said component substantially planar during processing of said component mounted in said frame,



said weight bar being mounted for reciprocal movement toward and away from the pull of gravity with the weight of the weight bar providing a gravitational force to restrain said board component,

said weight bar having ends slidably inter-engageable with side pieces of said frame to further restrain said board component,

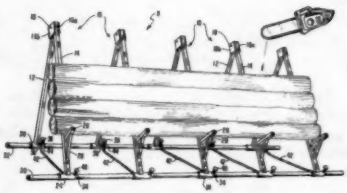
said weight bar being supported relative to said frame so that substantially the full weight of the weight bar imposes a gravitational force on said board component.

4,678,170

LOG HOLDER DEVICE

Robert L. Sampson, 901 W. 3rd, Anaconda, Mont. 59711

Continuation of Ser. No. 643,773, Aug. 24, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 852,620
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—296 **2 Claims**



1. An improved device for holding logs and for facilitating the cutting of logs into pieces when the device is positioned on a base surface comprising:

(a) upright means including at least two upright members extending upwardly from the base surface, for holding multiple logs stacked one on top the other, such logs being arranged with their longitudinal axes in a generally parallel and horizontal direction;

(b) a log support member being mounted to each upright member such that the log support member extends outwardly from the upright member at an angle of 90° or less with respect to the upright member, the log support mem-

ber being located in spaced apart relation with the base surface;

(c) means for holding the upright members in a spaced apart parallel relation, said means being located below the log support member;

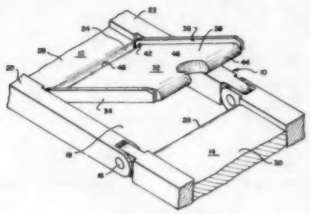
(d) the upright members being constructed so that when the upright members are positioned for holding logs, the log support members extend in an upwardly direction with respect to the horizontal direction and the space above the log support members and the top of the upright members and between the upright members is free from any obstructions.

4,678,171

POSITIONING LIFT FOR SURGICAL TABLE

Ward L. Sanders, and David W. Robinson, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Jun. 19, 1985, Ser. No. 746,411
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—325 **14 Claims**



1. In a surgical table having a multisectioned patient support surface including a back section for supporting the patient's back and at least one adjacent section, each of the sections being so pivotally movable relative to the adjacent sections that the table surface can assume a range of positions for anatomically posturing portions of the patient's body for different surgical procedures, the improvement comprising:

the back section defining an opening therein, said opening having a perimeter;

a movable member mounted in said opening and being so pivotally connected to a portion of said perimeter that said movable member can assume a range of articulated positions relative to the back section for lifting portions of the patient's body, the assumption of said positions within said range of articulated positions being selectively independent of the assumption of positions by the table surface; and

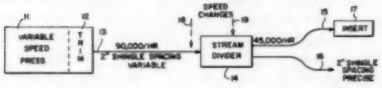
means for locking said movable member into selective positions within said range of articulated positions.

4,678,172

HIGH SPEED ON-LINE RESHINGLING OF PRINTED PRODUCTS

Hans G. Faltin, York, Pa., assignor to Custom-Bilt Machinery, Inc., York, Pa.

Filed Dec. 27, 1985, Ser. No. 813,878
Int. Cl.[4] B41F *13/64*
U.S. Cl. 270—18 **13 Claims**



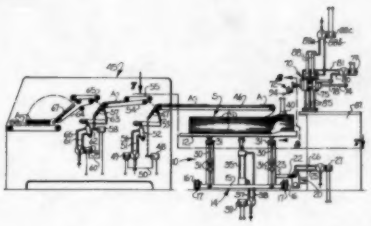
1. A printing system for downstream processing of shingled products conveyed from a variable speed printing press, comprising in combination, a variable speed printing press for providing a plurality of printed products, on-line conveyor delivery means downstream of said printing press for receiving printed products and for presenting printed products in shingled relationship in a press output stream at a predetermined product rate, reshingling means for processing the on-line product stream to divide the stream into two continuous streams of output shingled products conveyed at a product rate substantially less than said predetermined rate.

4,678,173

APPARATUS FOR AUTOMATICALLY AND CONTINUOUSLY FEEDING AND FOLDING TEXTILE ARTICLES

David M. Basinger, Kannapolis; Gary L. Hatley, Stanley; Billy J. Kiser, Concord, and James N. Moser, Kannapolis, all of N.C., assignors to Fieldcrest Cannon, Inc., Eden, N.C.

Filed Dec. 11, 1985, Ser. No. 807,869
Int. Cl.[4] B42C *1/00*
U.S. Cl. 270—45 **15 Claims**



1. Apparatus for automatically and continuously feeding and folding successive textile articles, such as towels and the like, from a supply stack of such textile articles; said apparatus comprising:

supply means including first and second table means for respectively receiving first and second supply stacks of the textile articles thereon, movable carriage means carrying said two table means for movement between a first position in which said first table means is in a feeding position for feeding of the textile articles from the stack thereon and said second table means is in a non-feeding position so that a stack of textile articles may be placed thereon and a second position in which said second table means is in the feeding position for feeding of the articles from the stack thereon and said first table means is in the non-feeding position so that a stack of textile articles may be placed thereon, means connected to said carriage means for selective movement of said carriage means between the first and second positions, means independently mounting said respective table means on said carriage means for vertical up and down movement, and means connected to said table mounting means for moving said table means in the vertical direction to maintain the stack of textile articles on said table means in the feeding position at a desired height as the textile articles are fed therefrom;

folding means for successively receiving the textile articles and for folding the textile articles into a desired folded condition; and

robot feeding means positioned adjacent said supply means and the supply stack of textile articles in the feeding position for successively picking-up the textile articles from the top of the stack in the feeding position and transporting them therefrom to said folding means and releasing the textile articles.

4,678,174

APPARATUS FOR PICKING-UP AND FURTHER TRANSPORTING, FOLDED PRINTED PRODUCTS, ESPECIALLY SIGNATURES OR SHEETS, FROM A CONVEYING DEVICE

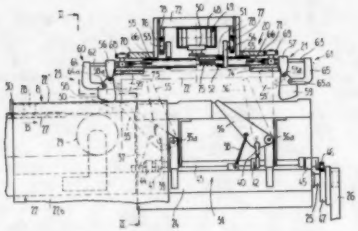
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Aug. 18, 1986, Ser. No. 897,419

Claims priority, application Switzerland, Aug. 29, 1985, 03708/85

Int. Cl.⁴ B65H *39/02*

U.S. Cl. 270—54 **18 Claims**



1. An apparatus for picking-up and further transporting folded printed products, especially signatures or sheets, from a conveying device upon which the folded printed products straddlingly rest with folded edges thereof substantially aligned in the direction of conveyance of the conveying device, comprising:

elevating means for elevating the folded printed products;

transport means for further transporting the folded printed products away from the conveying device;

said transport means comprising a product withdrawal device for picking-up the folded printed products from said elevating means by entering between respective product portions of each folded printed product; and

said product withdrawal device comprising a circulatingly driven traction member and a plurality of controllable holding means mounted on said circulatingly driven traction member for laterally entering between said respective printed products at folded edges thereof.

4,678,175

SHEET MONEY FEEDING MACHINE WITH IMPROVED SEPARATION MEANS

Brian D. Arldt, Austin, Tex.; Jonathon T. Loeb, Concord; Joseph C. Miller, Huntersville, both of N.C.; Hossein B. Parsapour, Darnestown, Md.; Fred H. Rascoe, III, and Don W. Woodward, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 798,777, Nov. 18, 1985, abandoned. This application Aug. 8, 1986, Ser. No. 894,707

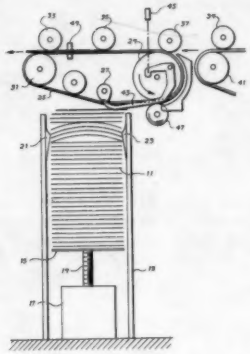
Int. Cl.⁴ B65H *3/04*

U.S. Cl. 271—34 **5 Claims**

1. A sheet money feeding machine comprising: a friction feed means disposed above a cassette, said friction feed means having an actuator for selectively feeding a top sheet of money from a stack of money in said cassette;

said cassette having a pair of sidewalls and a moveable bottom, said bottom being connected to a motor for raising said bottom as sheets of money are fed from the top of said stack of money in said cassette, so as to maintain said top of said stack of money substantially at the top of said cassette;

an inwardly projecting ramp extending from each of said sidewalls for squeezing each sheet inwardly and causing it to bow upwardly and be separated from the immediately underlying sheet, as said stack of money is raised in said cassette, said ramp means being spaced from said top of said cassette for permitting those sheets of money which



have passed said ramp means to again lie substantially flat in preparation for feeding by said friction feed means.

4,678,176

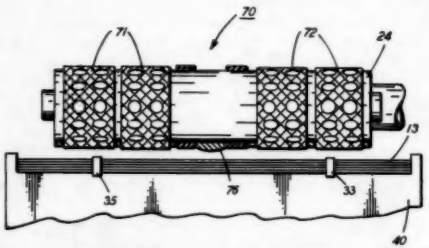
FRONT AIR KNIFE TOP VACUUM CORRUGATION FEEDER

George J. Roller, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1985, Ser. No. 795,678

Int. Cl.⁴ B65H *3/12*

U.S. Cl. 271—94 **7 Claims**



1. A top sheet feeding apparatus comprising a sheet stack support tray for supporting a stack of sheets within the tray, air knife means positioned immediately adjacent the front of said stack of sheets for applying a positive pressure to the sheet stack in order to separate the uppermost sheet in the stack from the rest of the stack, and feedhead means including a vacuum plenum chamber positioned over the front of the sheet stack having a negative pressure applied thereto during feeding, said vacuum plenum chamber having a sheet corrugation member located in the center of its bottom surface and perforated feed belt means associated with said vacuum plenum chamber to transport the sheets acquired by said vacuum plenum chamber in a forward direction out of the stack support tray, and wherein said perforated feed belt means includes a multiple shaft tipped knurled elastomer surface that is configured such that frictional contact is enhanced between said perforated feed belt means and each sheet in said stack of sheets and a more uniform vacuum force is applied over the entire sheet area once a negative pressure is applied to the top sheet in the sheet stack by said vacuum plenum.

4,678,177

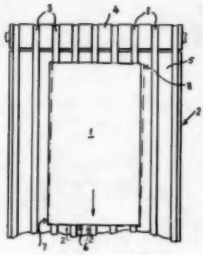
REGISTERING METHOD

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Continuation of Ser. No. 39,270, May 16, 1979, abandoned, which is a continuation of Ser. No. 794,096, May 5, 1977, abandoned. This application Apr. 21, 1981, Ser. No. 256,132

Int. Cl.[4] B65H *9/04*

U.S. Cl. 271—238 **2 Claims**



1. Apparatus for stationarily positioning a sheet of thin flexible paper-like material at a given location in a process station including in combination, means for gravitationally supporting and frictionally conveying a sheet of material along a path having a certain direction from a remote location to said given location with the leading edge of said sheet normally generally perpendicular to said direction, said conveying and supporting means permitting sliding movement of the sheet relative thereto in response to an obstacle encountered by an edge of said sheet, first stop means at said station for engaging the leading edge of a normally conveyed sheet at one side of the centerline thereof with reference to said direction while leaving the leading edge at the other side of said centerline free for initiating a turning movement of said sheet relative to said conveying means and to said path direction as it enters said given location, a second stop at said station positioned to engage one side edge of said sheet adjacent to a leading corner thereof and a third stop at said station positioned at a location along said path spaced rearwardly of the second stop to engage the other side edge of said sheet adjacent to a trailing corner thereof, said second and third stops positively arresting said turning movement after a predetermined movement while inhibiting sliding movement of said sheet relative to said first stop means generally in the direction of said turning movement accurately to hold said sheet at said station in a skewed position relative to said path direction to permit an operation to be performed on said sheet.

4,678,178

SHEET MATERIAL CONVEYING DEVICE

Kazunori Akiyama, Takatsuki; Arihiro Tsunoda, Sakai, and Satoshi Tanaka, Yao, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 26, 1985, Ser. No. 705,804

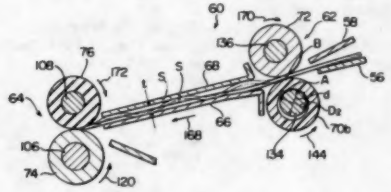
Claims priority, application Japan, Feb. 29, 1984, 59-29973[U]; Oct. 30, 1984, 59-164871[U]

Int. Cl.[4] B65H *9/14*

U.S. Cl. 271—242 **10 Claims**

1. In a paper sheet material conveying device for feeding paper sheets in an electrostatic copying machine, said conveying device being of the type comprising a feed roller assembly for feeding the paper sheets in a feed direction and temporary hampering means, located downstream of said feed roller assembly with respect to said feed direction, for temporarily stopping forward movement of a paper sheet being fed by said feed roller assembly, said feed roller assembly comprising a driven shaft extending substantially horizontally, means for continuously rotating said driven shaft, a follower shaft extending substantially horizontally at a position above said driven shaft, and at least one follower roller mounted on said follower shaft, said driven rollers and said follower roller rotating and nipping therebetween a paper sheet during feeding thereof by said feed roller assembly, and the paper-sheet, upon being stopped temporarily by said hampering means, preventing rotation of said follower roller, the improvement comprising means for, upon the paper sheet being stopped by said hampering means, reducing soiling of the paper sheet without interruption of the continuous rotation of said driven shaft, said reducing means comprising:

said plurality of driven roller comprising at least one first driven roller having a non-slip rotary connection with said driven shaft and at least one second driven roller having an inside diameter larger than the outside diameter of said driven shaft and mounted on said driven shaft with a rotary slip connection therebetween, said non-slip rotary



connection comprising means for displacing said first driven roller upwardly and downwardly with respect to said driven shaft during each revolution thereof between an upper position, whereat the uppermost surface of said first driven roller is at substantially the same level as the uppermost surface of said second driven roller, and a lower position below said level; and

said first and second driven rollers contacting the paper sheet and cooperating with said follower roller to nip therebetween the paper sheet during feeding thereof;

whereby when feeding of the paper sheet is stopped temporarily by said hampering means, rotating of said at least one second driven roller is interrupted during continued rotation of said driven shaft due to said rotary slip connection therebetween, while rotating of said at least one first driven roller is continued during continued rotation of said driven shaft due to said non-slip rotary connection therebetween.

4,678,179

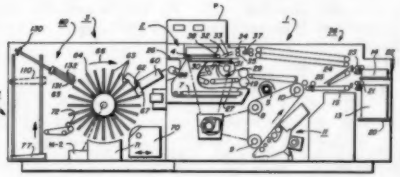
COPYING MACHINE WITH A ROTARY SORTER HAVING SHEET GRIPPING DEVICES

William B. Edwards, and Thomas J. Hamlin, both of Macedon, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1984, Ser. No. 684,772

Int. Cl.[4] B65H *39/10*

U.S. Cl. 271—295 **12 Claims**



1. A sorting apparatus for collating sheets entering the same as a stream of sheets comprising:

a frame;

a sorter mounted for rotation on said frame having radially extending bins arranged in the path of the stream of sheets

to receive the stream of sheets at a loading station and to collate the same into booklets,

means for imparting indexing rotation to said sorter relative to said loading station whereat a sheet is received for each indexing motion,

means for registering the sheets within said bins,

each of said bins having a sheet retaining means for engaging the received sheets and to hold the same in registered condition therein during rotation of the sorter, and

means for releasing each of said retaining means when each bin is indexed to said loading station to permit the entry of a sheet therein.

4,678,180

SELECTIVE SHEET FEEDER

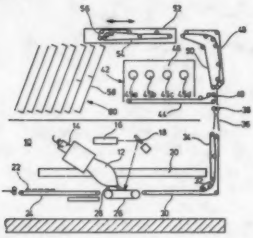
Kaoru Tamura; Kawai Yasuhiro, and Isao Utsumi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 21, 1985, Ser. No. 789,812

Claims priority, application Japan, Oct. 20, 1984, 59-220677; Oct. 20, 1984, 59-220678; Apr. 18, 1985, 60-84030

Int. Cl.[4] B65H *39/115*

U.S. Cl. 271—296 **17 Claims**



1. A selective sheet feeder comprising: a plurality of trays **(58)** having openings directed upwardly and inclined at a prescribed angle; and a sheet feed unit **(52)** movable along a travel path over said trays, said sheet feed unit including a casing **(62)**, belt conveyor means **(54,56)** dispose in said casing, a first rotational drive source **(63)** for driving said belt conveyor means, and a second rotational drive source **(61)** for moving said sheet feed unit along said travel path, said sheet feed unit being movable, while a sheet **(22)** is held on said belt conveyor means, toward and stoppable in a position over a prescribed one of said trays, and said belt conveyor means being drivable by said first rotational drive source for discharging said sheet into said prescribed tray.

4,678,181

HAND DEVELOPMENT SYSTEM

John R. Ditsch, Tinley Park; Theodore G. Williams, Lyons, and Luis H. Berrios, Chicago, all of Ill., assignors to HDS, Inc., Tinley Park, Ill.

Continuation-in-part of Ser. No. 755,708, Jul. 16, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,851

Int. Cl.[4] A63B *11/08*

U.S. Cl. 272—68 **31 Claims**

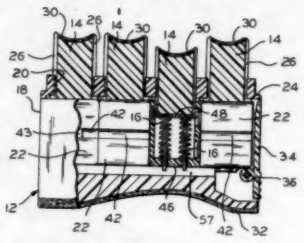
1. A hand development system, comprising:

a body adapted to be gripped by the hand of a user, said body including a single interior compartment and a plurality of openings in communication with said single interior compartment, said openings being provided along a top edge of said body;

means for exercising the fingers of the user, said exercising means being operatively associated with said body and including a plurality of individually movable members each adapted to be moved by one of the fingers of the user, said exercising means also including means for resisting movement of said individually moveable members;

said individually moveable members each comprising a key adapted to be depressed from a normal position by one of the fingers of the user, one of said keys being disposed in each of said openings and normally extending outwardly therefrom, said body being generally rectangular in shape and said openings being disposed in longitudinally aligned relationship, said keys each being adapted for sliding movement relative to the corresponding one of said openings;

means for access to said single interior compartment of said body, said access means being independent of said openings for said keys and spaced therefrom, said access means



normally maintaining said single interior compartment of said body substantially entirely enclosed;

said movement resisting means including a set of spring-loaded cartridges disposed in said single interior compartment, said cartridges each including at least one spring having a selected resistance to depression of said keys, said cartridges being removable from said single interior compartment through said access means;

said interior compartment of said body being generally rectangular in shape, said cartridges also being generally rectangular in shape, said cartridges being sized for sliding insertion into said interior compartment; and

means for accurately positioning each of said cartridges within said single interior compartment for resisting movement of one of said keys.

4,678,182

BICYCLE ERGOMETER AND EDDY CURRENT BRAKE THEREFOR

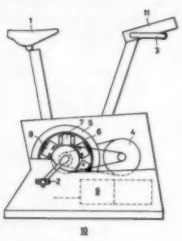
Shinroku Nakao, Kanagawa; Masao Itoh, Tokyo; Akira Itoh, Tokyo, and Hiroshi Takano, Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1984, Ser. No. 588,933

Claims priority, application Japan, Jul. 8, 1983, 58-123172; Jul. 8, 1983, 58-123173

Int. Cl.[4] A63B *69/16*

U.S. Cl. 272—73 **3 Claims**



1. An ergometer for obtaining an optimum athletic load value for a user of an exercise device in which the legs of the user are bent and stretched to rotate a rotary unit having a

variable load applied thereto during continuous exercise by the user, the athletic load value being increased step-wise in accordance with a linear load versus pulse rate correlation graph, the ergometer comprising:

means for sequentially setting the load to first, second, and third levels;

means for determining a first data corresponding to the pulse rate of the user at rest, a second data corresponding to the pulse rate of the user after exercise with the rotary unit having said first load level applied thereto, a third data corresponding to the pulse rate of the user after exercise with the rotary unit having said second load level applied thereto, and a fourth data corresponding to the pulse rate of the user after exercise with a rotary unit having said third load level applied thereto;

means for providing a reference graph comprising the pulse rate versus load level correlation graph as computed by a minimum square law average;

means responsive to said first, second, and third data for determining from said referenace graph said first, second, and third levels according to said first, second, and third data, respectively, and for controlling said setting means to sequentially set said load to said first, second and third levels; and

optimum load determining means for determining an optimum load level for the user from said second to fourth data if said fourth data is less than an athletic safety pulse rate or from said first to third data if the pulse rate of the user reaches the athletic safety pulse rate before said determining means determines said fourth data.

4,678,183

DEVICE FOR SKI TRAINING

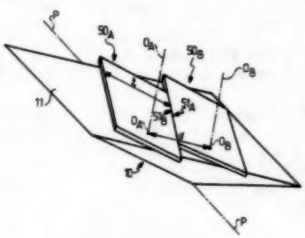
Joseph Skovajsa, 19, Avenue Vauquelin, 93470 Coubron, France

Filed Oct. 4, 1985, Ser. No. 784,848

Claims priority, application France, Oct. 10, 1984, 84 15543

Int. Cl.[4] A63B *69/18*

U.S. Cl. 272—97 **18 Claims**



1. A ski training device comprising:

a support plate, oscillating about a longitudinal principal axis of symmetry, said support plate formed of a body having a flat upper surface and a lower surface composed of two relatively inclined planes delimiting a principal longitudinal pivot bearing about said longitudinal principal axis at the vicinity of their junction, and

two sole plates for the feet of the user, said sole plates being pivotally carried on said support plate, respectively on one side and the other of a plane of symmetry passing through the principal pivot axis of said support plate, about respective auxiliary axes, generally parallel to each other and perpendicular to the upper surface of said support plate, so that alternating pivoting of said sole plates about their respective auxiliary axes, brought about by the user, is accompanied by an alternating rocking of said support plate about the associted principal axis.

4,678,184

CONSTANT FORCE EXERCISE DEVICE

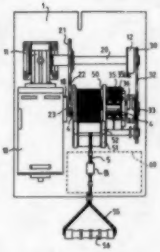
Henri J. C. Neiger, Melesse; Claude M. Genot, Mordelles; Gérard C. Prud'Hon, Boulogne, and Michel Schoens, Villiers le Bel, all of France, assignors to Merobel - Societe Anonyme Fracaise, Paris, France

Filed Jan. 17, 1985, Ser. No. 692,658

Claims priority, application France, Jan. 20, 1984, 84 00925

Int. Cl.[4] A63B *21/24*

U.S. Cl. 272—129 **13 Claims**



1. An apparatus for training, investigating and reeducating neuro-muscular functions in a subject, the apparatus comprising:

a frame fixed on a support;

a work member, supported by said frame, for interfacing with a subject to be exercised;

a non-drivable motor means rotable in a motor direction

first and second mechanical transmission means arranged in parallel between the motor means and the work member;

said first mechanical transmission means being provided for driving said work member in a first direction of motion, depending upon the motor direction, and comprising a controllable force coupler;

said second mechanical transmission means being provided to drive said work member in a second direction of motion opposed to said first direction of motion, and comprising a unidirectional drive means for rendering said second mechanical transmission means operative when an absolute value of the ratio between the work member speed and the motor means speed exceeds a preselected threshold; and

means for controlling said motor means and said controllable force coupler as a function of predetermined parameters.

4,678,185

EXERCISE APPARATUS

Parker E. Mahnke, Studio City, Calif., assignor to Marcy Gymnasium Equipment Co., Alhambra, Calif.

Filed Jan. 17, 1986, Ser. No. 820,538

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—134 **15 Claims**

1. An exercise apparatus for use by a trainee in the performance of various exercises, including arm and leg exercises, said apparatus comprising:

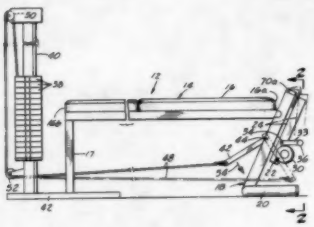
(a) support means for supporting the trainee in various exercising positions;

(b) first body engaging means disposed proximate said support means for engagement by the trainee in the performance of a first exercise to impart pivotal movement thereto about a pivot axis spaced a first distance from said support means, said body engaging means being movable relative to said support means from a first position to a second spaced position wherein said body engaging means is engageable by the trainee in the performance of a second exercise to impart pivotal movement thereto about a pivot axis spaced a second distance from said support means;

(c) resistance means operably associated with said body engaging means for providing a constant resistive force to resist pivotal movement of said body engaging means when said latter means is in either said first or second position; and

(d) linkage means for operably interconnecting said resistance means with said body engaging means, said linkage means comprising:

(i) a first linkage adapted for pivotal movement about a fixed axis located a fixed distance from said support



means, said first linkage being operably interconnected with said resistance means; and

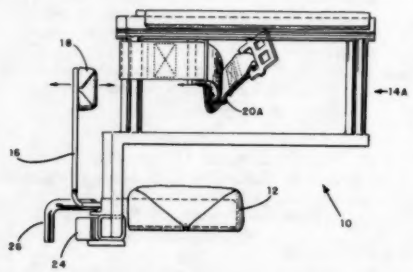
(ii) a second automatically adjustable linkage for operably interconnecting said body engaging means with said first linkage when said body engaging means is in either said first or second position, whereby pivotal movement of said body engaging means by the trainee will cause pivotal movement of said first linkage about said fixed axis, which pivotal movement will be uniformly resisted by said resistance means.

4,678,186

PELVIC RESTRAINT FOR EXERCISE APPARATUS

Donald R. McIntyre, Chapel Hill, and James E. Miles, Graham, both of N.C., assignors to Isotechnologies, Inc., Hillsborough, N.C.

Filed Jan. 17, 1986, Ser. No. 820,719
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **12 Claims**



8. In combination with a back exercise machine particularly adapted for providing resistance to movement by the user, a pelvic restraint comprising:

seat means for accommodating at least a portion of the buttocks of the upstanding user;

a pair of laterally spaced-apart hip restraint means adjustably engaging said seat means for restraining hip movement, said pair of restraint means extending generally upwardly from said seat means and in converging relationship to each other so as to engage the hips of the user;

strap restraint means secured to said pair of hip restraint means and extending therebetween for restraining forward movement of the pelvis of the user;

back restraint means adjustably engaging said seat means for engaging the low back of the user to restrain rearward movement of the pelvis; and

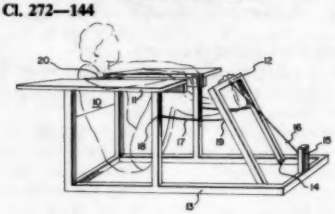
means for coupling said pelvis restrain device to a back exercise machine.

4,678,187

EXERCISE DEVICE TO SUPPORT USER'S BODY

Jan Prsala, P.O. Box 91, Site 12, R.R. #3, Armdale, Nova Scotia, Canada B3L 4J3

Filed Feb. 4, 1985, Ser. No. 697,975
Claims priority, application Canada, Feb. 2, 1984, 446659
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—144 **12 Claims**



1. An exercise device comprising:

(a) a frame having a front and rear end;

(b) an upper trunk support comprising a unit including a pair of arm supports and a back support, said upper trunk support connected to said frame near said rear end by an upright suspension means;

(c) a footrest connected to said frame near said front end, wherein one of the upper trunk support or the footrest is movable in relation to the other and the other is fixed;

(d) a resilient means operatively connected to the movable one of the upper trunk support or the footrest for resisting movement thereof; and

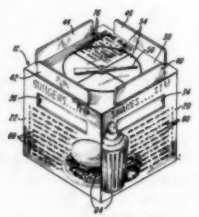
whereby the device entirely supports a person by the upper trunk and feet of the person so that the person's body, at least from the lower back to the knees, is freely suspended.

4,678,188

QUESTION AND ANSWER GAME STRUCTURE PARTICULARLY FOR USE IN A RESTAURANT OR THE LIKE

David W. Johnson, 5860 Hanley Rd., Jamestown, Ohio 45335

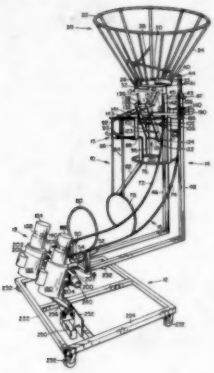
Filed Sep. 16, 1985, Ser. No. 776,514
Int. Cl.[4] A63F *9/18*
U.S. Cl. 273—1 R **11 Claims**



1. A question and answer game structure comprising a body which is substantially in the form of a cube and provided with a plurality of indicia-carrying side surfaces, each indicia-carrying side surface being provided with indicia in the form of questions, a plurality of answer-carrying member, there being one answer-carrying member movably positioned within the body and adjacent each of the indicia-carrying side surfaces, and selector means movably carried by the body for identify-

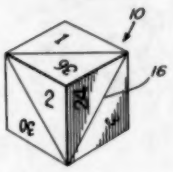
ing one of the indicia-carrying side surfaces for consideration of the questions carried thereby.

4,678,189
BASKETBALL RETURN DEVICE
Richard E. Koss, 3530 E. 8th Ave., Denver, Colo. 80206
Filed Aug. 1, 1985, Ser. No. 761,320
Int. Cl.[4] A63B 69/00
U.S. Cl. 273—1.5 A **1 Claim**



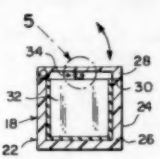
1. A basketbal return mechanism, comprising:
a lower support frame;
an upper support frame pivotally mounted on said lower frame and rotatable in a horizontal plane with respect to said lower frame, said upper support frame comprising a vertical portion and a horizontal portion;
a basket-mounting frame releasably secured to said vertical portion of said upper frame, said mounting frame securable in a multiplicity of extended vertical positions with respect to said upper frame;
a ball-receiving basket attached to said basket mounting frame, said basket having first and second ends and being adapted to receive a ball through said first end and to pass said ball through said second end;
two rotatable heads carried on said horizontal portion of said upper frame, said head separated by a distance sufficient to allow a ball to pass therethrough, with said ball being engaged by opposing faces of said heads;
first motor means for rotating said heads in opposite directions such that a ball engaged by said opposing faces of said rotating heads is propelled toward a player;
a ball delivery track adapted to transport a ball from said ball-receiving basket to a position between said rotatable heads;
ball retaining means having a first position and a second position, said retaining means operable to restrict passage of a ball from said ball-receiving basket to said delivery track with said ball in said first position and operable to permit passage of said ball with said retaining means in said second position;
means for biasing said retaining means toward said first position;
actuator means for moving said retaining means to said second position;
timer means for activating said actuator means at timed intervals to allow a ball to pass from said ball-receiving basket to said delivery track; and
second motor means for rotating said upper frame in a horizontal plane with respect to said lower support frame.

4,678,190
SET OF DICES FOR LOTTERY
Yves Dery, 4500 Samson Boulevard - unité 4, Chomedey, Laval, Quebec, Canada H7W 2H1
Filed Mar. 18, 1986, Ser. No. 840,682
Int. Cl.[4] A63F 9/04
U.S. Cl. 273—146 **5 Claims**



1. A set of dices to be thrown on a surface for aiding a lottery player in the selection of winning integers in a lottery of the type in which one must select a pre-determined number of integers in a given series of such integers, the number of dices in the set being equal to the number of integers to be selected in the specific lottery type, at least some of the six faces of each dice bearing at least two distinct integers forming two series of lottery integers, the dice integers being distributed on the various dice faces such that each integer will appear on two dices and such that all the integers on any given dice will not appear on any other single dice but will be distributed amongst the remaining dices of the set.

4,678,191
MULTIPLE DICE GAME
Sean R. Mills, and George Spector, both of 233 Broadway Rm 3615, New York, N.Y. 10007
Filed Oct. 4, 1985, Ser. No. 784,584
Int. Cl.[4] A63F 9/04
U.S. Cl. 273—146 **3 Claims**



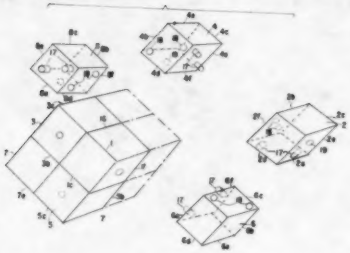
1. A multi-player game of chance comprising:
(a) a set of five chips for each said player of said game;
(b) a pot for holding various amounts of said chips during the course of said game; and
(c) five indentification devices bearing identifying indicia, each said device capable of being manipulated to indicate random placement of each said chip of each said player within said pot and to other said players until one said player is left with at least one said chip to win all of said chips within said pot, wherein each said identification device is a cube, each face of said cube bearing different identifying indicia, and each said cube comprises:
(a) a hollow shell having a hinged lid on one side with various combinations of said identifying indicia provided on said faces of said shell; and
(b) a removeable insert placed within said hollow shell so that proper weight can be added to said shell when said device is manipulated by tossing and rolling of said cube.

4,678,192

MANUALLY ASSEMBLED PUZZLE APPARATUS

Bruce E. Campbell, P.O. Box 118, Smithfield, Va. 23430

Filed Jan. 2, 1986, Ser. No. 815,541
Int. Cl.[4] A63F *9/12*; A63H *33/08*
U.S. Cl. 273—157 R 33 Claims



15. A parallelepipedic puzzle formed from at least eight smaller parallelepipedic blocks, said puzzle comprising at least first, second, third, fourth, fifth, sixth, seventh, and eighth blocks, each block having first, second, third, fourth, fifth, and sixth faces wherein said first and fifth blocks, fifth and seventh blocks, seventh and third blocks, fourth and second blocks, second and sixth blocks, sixth and eighth blocks, third and fourth blocks, and seventh and eighth blocks, respectively, have faces which are directly connected to each other, all of the remaining faces being physically unattached to each other, each of said blocks including three exposed faces located on the exterior surface of said puzzle, wherein the three exposed faces of each of said fourth and said sixth blocks are flat and have no apertures, holes or pegs thereon.

4,678,193

GOLF SWING TRAINING DEVICE

Håkan Kronogård, Skarpskyttevägen 26 d, 222 42 Lund, and Roberto Selberg, Kilian Zollsgntan 28 a, 217 56 Malmö, both of Sweden

Filed Mar. 11, 1985, Ser. No. 711,802
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 C 10 Claims

1. A golf swing training device comprising:

a curved rod extending from an imaginary golf ball position and along a portion of a circle;

an adjustment means for adjusting the position of said curved rod;

a means for maintaining the curved rod in said adjusted position;

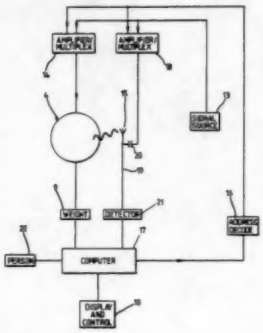
an indicator means for indicating when said curved rod has been adjusted to extend along a circle which corresponds to a desired swing circle in which a tangent of the curved rod at the imaginary golf ball position extends along a desired target line and the centrum of the swing circle is positioned substantially close to the shoulder portion of a golfer, and the curved rod extends from the imaginary golf ball position and in a direction away from the target.

4,678,194

TARGET APPARATUS INCLUDING TRANSMITTING/RECEIVING DART

William H. Bowyer, Farnham; Robert L. Crocker, Farnham Royal; Christopher M. Hansford, Beaconsfield; Leslie K. Parker, High Wycombe, and Nigel Gray, Winchester, all of England, assignors to Viragate Limited, London, England

PCT No. PCT/GB83/00264, § 371 Date Jun. 18, 1984, § 102(e) Date Jun. 18, 1984, PCT Pub. No. WO84/01618, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 18, 1983, Ser. No. 624,665
Claims priority, application United Kingdom, Oct. 18, 1982, 8229686
Int. Cl.[4] A63B *63/00*
U.S. Cl. 273—373 16 Claims



1. A target in which projectiles may be embedded, said target including a target face, the target face being divided into a plurality of bed, the beds being formed from substantially parallel fibres that are, or have been treated to be, conductive at least on the outer surfaces of said fibres adjacent the face of said target, said fibres in each bed extending substantially normally to the target face and being insulated from the fibres in adjacent beds, further including a backing means for mounting said fibres substantially normal to said backing member, each of said fibres having a free end, where the free ends of said fibres define said target face wherein conductive means are provided connected to each of said beds to enable a separate signal to be applied to each bed, and wherein aerial means are provided to respond to a signal radiated from a dart protruding from any bed.

4,678,195

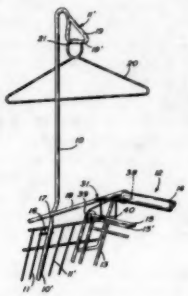
SHOPPING CART APPAREL HANGER

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari All Inc., Quebec, Canada

Filed Dec. 26, 1985, Ser. No. 813,424
Int. Cl.[4] B62D *39/00*
U.S. Cl. 280—33.99 A 5 Claims

1. In a shopping cart having a frame supported on casters, said frame defining a basket having side walls, a front and rear wall, a bottom wall and an open top end, a handle bar secured to said frame rearwardly of said rear wall to displace said shopping cart on said casters, the improvement comprising an elongated support rod telescopically secured to one of said side walls and extending substantially vertically from one of said side walls above said open top end, and support means formed in a top end of said support rod for supporting articles of clothing outside said basket and above a floor surface, said support rod having a straight securement section received in a pipe coupling secured to said one of said side walls of said basket, said pipe coupling extending substantially vertically and having an elongated straight guide slot therein, a locking cavity formed integral with said guide slot in a top end thereof,

said straight securement section having a transverse guide finger projecting through said slot and configured to enter said locking cavity whereby to support said support rod in an



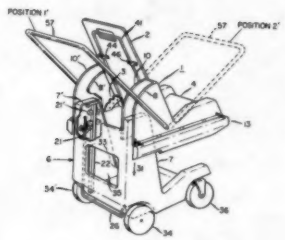
extended position above said basket open top end, said support rod also having an engaging bottom end configured to overlap a rod of a bottom section of said frame to support said support rod in a retracted position.

4,678,196

CHILD CAR SEAT CONVERTIBLE INTO A STROLLER

Kip Van Steenburg, 4 Marlboro Rd., Sudbury, Mass. 01776

Filed Feb. 5, 1986, Ser. No. 826,408
Int. Cl.[4] B62B *7/10*
U.S. Cl. 280—47.41 **8 Claims**



1. A child transporter comprising:

child support means having a support surface for supporting said child;

base means having roller means at lower portions thereof;

user activated positioning means for selectively causing said child support means to be maintained in a first extended position separated from said roller means, by a sufficient distance to enable said transporter to be readily utilized as a stroller, or to be maintained in a second collapsed position wherein said child support means is adjacent said roller means, enabling said transporter to be utilized as a car seat and readily positioned within a vehicle and upon a seat thereof; and

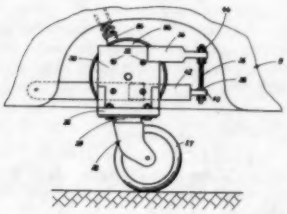
said roller means including wheels rotatably mounted to first and second lower portions of said base member and further including wheel cover means, wheel cover support means for mechanically supporting and biasing said wheel cover means against side portions of said base member for causing said wheel cover means to clear said wheels during transition of said superstructure from said first position to said second position, and to thereafter inwardly rotate in a first direction to automatically cover lower rim portions of said wheels.

4,678,197

ARRANGEMENT FOR INFLUENCING THE KEEPING OF A DRIVING DIRECTION BY A MOTOR VEHICLE

Willy Stein, Kindelbergweg 1, 7253 Renningen, Fed. Rep. of Germany, assignor to Willy Stein, Renningen, Fed. Rep. of Germany

Filed Jul. 21, 1986, Ser. No. 887,263
Int. Cl.[4] B62D *63/00*
U.S. Cl. 280—80 R **9 Claims**



1. An arrangement for influencing the keeping of a driving direction by a motor vehicle having at least one non-driven wheel support body which is mounted on a wheel suspension for rotation about an axis, comprising

a holding component rigidly connected to the wheel support body;

a caster including a wheel centered on a rotational axis, and means for mounting said wheel on said holding component for rotation about said rotational axis thereof and also for turning about an additional axis which is substantially normal to the axis of the wheel support body and to said rotational axis of said wheel; and

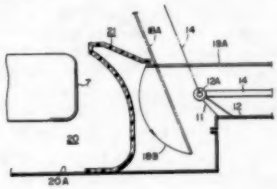
means for preventing the rotation of the wheel support body about the axis thereof, said preventing means being connected to a non-rotatable part of the wheel suspension.

4,678,198

CONSTRUCTION OF MUDGUARD OF MOVABLE FENDER PORTION IN MOTOR VEHICLE

Kazuhiro Nomura, Anjyo, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 17, 1984, Ser. No. 611,339
Claims priority, application Japan, May 19, 1983, 58-74912
Int. Cl.[4] B62B *9/14*
U.S. Cl. 280—153 A **8 Claims**



8. A tire mudguard for a vehicle having a movable fender comprising:

a vehicle frame including a wheel section, a fender section and a door section, said fender section being positioned substantially between said wheel section and said door section, said wheel section having an arcuate inner wall radially spaced from the tire to extend across the tire and around a predetermined amount of the circumference of the tire, said inner wall having a bowed outer edge extending radially inward, said wheel section also having a side wall extending radially outward from said outer edge, said side wall having a distal portion proximate said fender section, said fender section having a movable member and

a fixed member, said movable member having a leading edge proximate said distal portion;

support means adapted to be mounted on said vehicle frame for supporting said movable member and said door section; and

means for pivotally connecting said movable member and said door section to said support means, said movable member extending between said support means and said door section, wherein opening of said door section pivots said movable member about said support means producing an arcuate path of movement for said leading edge, while preventing engagement between said movable member and said wheel section, said arcuate path of movement extending substantially between said support means and said wheel section.

4,678,199

VEHICLE TRAILER HITCH

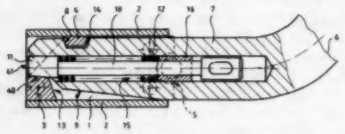
Thomas Dickmann, Erich-Heckel-Strasse 63, 7500 Karlsruhe 41, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,270

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1985, 3541520; Jun. 4, 1986, 3618809

Int. Cl.[4] B60D *1/06*

U.S. Cl. 280—491 E **19 Claims**



1. A trailer hitch for a vehicle, especially a motor vehicle, said trailer hitch comprising: a support tube structure adapted to be mounted to a vehicle body, a ball carrying bar removably supported in said tube structure, said tube structure having a projecting end with engagement surfaces and said ball bar having engagement bolts projecting therefrom in opposite directions and being arranged so as to be received and abut said engagement surfaces, a locking member disposed at the inner end of said tube structure and having a wedging wall face, a support block also disposed at the inner end of said tube structure opposite said locking member and having an inclined ramp area, and a safety bolt axially movably disposed within a passage in said ball bar and having a head adapted to project, under the force of a spring, out of said ball bar, said head having an inclined wedging surface corresponding to the ramp area of said support block so as to force said ball bar into firm engagement with said locking member's wedging wall face under the force of said spring, and means for locking said safety bolt in its outwardly projecting ball bar locking position.

4,678,200

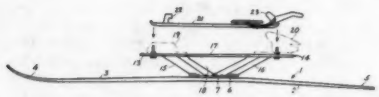
PLATFORM FOR ATTACHING TO A SKI TO PROVIDE A MONOSKI

William Powell, R.D. 3, Box 95, Andover, N.J. 07821

Filed Dec. 20, 1985, Ser. No. 811,290

Int. Cl.[4] A63C *5/00*

U.S. Cl. 280—607 **20 Claims**



1. An improved platform for attaching to a ski having an upturned tip portion on one end thereof and a tail portion on the other end thereof to provide a monoski comprising:

a single base member;

means to secure said base member at a predetermined location on an upper surface of said ski between said tip portion and said tail portion;

a first plate disposed substantially parallel to and spaced a first predetermined distance above said base member, said first plate being capable of supporting the toe portion of both feet of the skier;

a second plate disposed substantially parallel to and spaced a second predetermined distance above said base member in a predetermined longitudnal spaced relationship with said first plate, said second plate being capable of supporting the heel portion of both feet of said skier;

a first bar-like column extending toward said tip portion at a first predetermined acute angle from said base member to said first plate to support said first plate above said base member;

a second bar-like column extending toward said tail portion at a second predetermined acute angle from said base member to said second plate to support said second plate above said base member; and

a rigid bar-like member secured to and extending between said first and second plates.

4,678,201

SKI BINDING

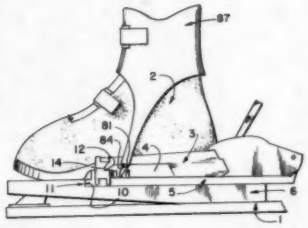
Gregory Williams, 20 May Road, Mt. Roskill, Auckland, New Zealand

Filed Jul. 27, 1984, Ser. No. 635,278

Claims priority, application New Zealand, Aug. 3, 1983, 205133; Feb. 24, 1984, 207265

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—620 **41 Claims**



1. A ski stressing means comprising a ski-boot, at least one lever mounted on said ski-boot and tensioning means between said at least one lever and said ski, said tensioning means comprising a tensioning member, a connection means between said ski and said tensioning member, said connection means comprising a slide member having a slot therein, a pin movable in said slot and attached to said ski, said slot being disposed relative to said ski so that movement of said pin in said slot can cause selectively an increase and decrease in distance between said ski and said slide member.

4,678,202

FOLDING WHEELCHAIR

Tom M. Jensen, Everett; Frederick T. Yoshimura, Seattle, and Deborah P. Jensen, Everett, all of Wash., assignors to The Boeing Company, Seattle, Wash.

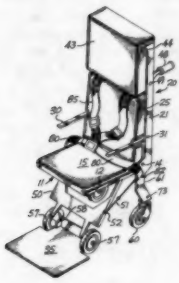
Continuation of Ser. No. 811,068, Dec. 19, 1985, Pat. No. 4,640,525. This application Oct. 23, 1986, Ser. No. 922,217

Int. Cl.[4] B62B *7/08*

U.S. Cl. 280—642 **6 Claims**

1. A wheelchair assembly, comprising: a back frame having a pair of vertically parallel side frame members and transverse frame members secured between said side frame members for integrally forming a rigid back frame; a seat pan frame extending horizontally forward from said back frame when in posi-

tion for occupancy and being pivotally supported at its aft end to said back frame for limited articulation between a forward extended, horizontal position for occupancy and a rearward retracted, vertical position for stowage; said seat pan frame having side frame members with a lengthwise orientated slot including a locking detent located at the forward end of the slot; rear legs formed by the lower portion of said back frame; a front leg assembly having an their upper extent with means cooperating within the slots in said seat side frame members for rearward retraction or forward extension movement in said slot, relative to the rear legs when said seat pan frame is articulated from its stowed position to its seating position respectively; said front leg assembly having upper extent locked in a forward extended position by the detent in said slot when an occupancy load is applied to said seat pan frame; a front leg brace comprising a folding linkage having a forward extent connected to the midportion of said front leg assembly and having a rearward extent connected to said back frame for forming a diagonal brace for maintaining the lower extnt of said front leg assembly in a forward extended positon; and wheels mounted to the lower end of the front leg assembly and the rear legs for rolling movement of the wheelchair assembly.



4,678,203

AIR SPRING

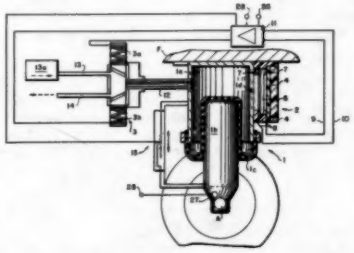
Gerhard Röhner, Mannheim; Willi Schweikert, Heidelberg, and Gerd-Heinz Ticks, Wald-Michelbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,415

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434660

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—707 **20 Claims**



1. An air spring for use between relatively-moving bodies comprising, in combination:

(a) means providing a variable interior space filled with a gas at a mean pressure for spring action between the bodies;

(b) a compressed - gas source;

(c) a supply line having an intake valve connecting said source to said interior space;

(d) an outlet line having an outlet valve connecting said interior space to a low pressure gas sink;

(e) a control device having an electric sensor for detecting the pressure in said interior space; and

(f) means responsive to said control device for actuating said intake and outlet valves;

wherein said control device opens said outlet valve when the pressure in said interior space exceeds said mean pressure and opens said intake valve when the pressure in said interior space falls below said mean pressure.

4,678,204

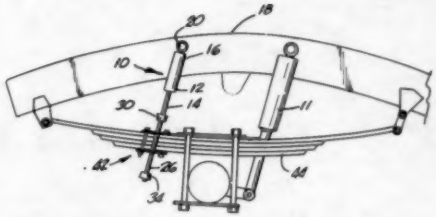
AUXILIARY SHOCK ABSORBER ASSEMBLY

Todd G. Hetherington, 1968 Church St., Costa Mesa, Calif. 92627

Filed Jul. 14, 1986, Ser. No. 885,272

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—710 **6 Claims**



1. An auxiliary shock absorber assembly adapted to be secured to the frame of a vehicle and to the vehicle suspension system for providing additional shock absorption in the event of the vehicle impacting an irregularity in the roadway, said assembly comprising a shock absorber having a piston rod extending from one end thereof and including means disposed therein for biasing said piston rod outwardly therefrom; means carried by said shock absorber for securing said shock absorber to the frame of the vehicle such that said piston rod extends downwardly therefrom, a first stop member carried by to said piston rod adjacent the end thereof, a second stop member carried by said piston rod and spaced from said first stop member; and a bracket assembly defining means for securing said bracket assembly to the vehicle suspension system and means for slidably receiving the portion of said piston rod disposed between said stop members thereon such that upon securing said shock absorber to the frame of the vehicle and said bracket to the vehicle suspension system with said piston rod being slideably through said bracket assembly between said stop members, sufficient upward movement of the vehicle suspension system in response to the vehicle impacting an irregularity in the roadway causes said bracket assembly to abut said second stop member and urge said piston rod into said shock absorber thereby providing additional shock absorbtion for the vehicle.

4,678,205

METHOD AND APPARATUS FOR USE WITH A SAFETY HARNESS

Jay S. Wold, 2202 S. Emerson, Gillette, Wyo. 82716

Filed Jun. 3, 1985, Ser. No. 740,480

Int. Cl.[4] B60R *22/00*

U.S. Cl. 280—808 **2 Claims**

1. Apparatus for enhancing the use of safety harness in a vehicle comprising:

means for covering a portion of the safety harness with a comfortable material;

means for joining said covering means to said safety harness

so that said covering means may be readily moved to a desired location when said safety harness is applied by said user, will move relative to said safety harness but remain stationary relative to said user when said user moves and automatically move to a storage position when said safety harness is released by said user;

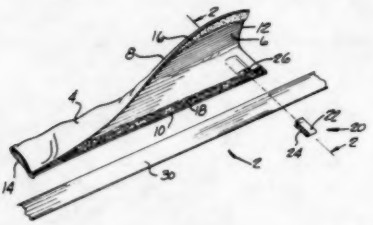
said means for joining said covering means to said safety harness comprising:

a spring means;

about one-half of said spring means being embedded in said covering means; said covering means comprising:

two rectangularly shaped pieces of comfortable material having two relatively long sides and two relatively short sides;

means securing said two rectangularly shaped pieces of



material in superposed relationship; means for surrounding said safety harness with said covering means comprising:

a "Velcro" fastener;

one-half of said "Velcro" fastener secured to said covering means adjacent to one of said relatively long sides;

the other half of said "Velcro" fastener secured to said covering means adjacent to the other of said relatively long sides; said spring means comprising:

a spring clip having a length greater than its width;

the lower half of said spring clip being located and secured between said two rectangularly shaped pieces of comfortable material with said length extending in a direction parallel to said relatively short sides; and

the opening of said spring clip facing the centerline between said long sides.

4,678,206

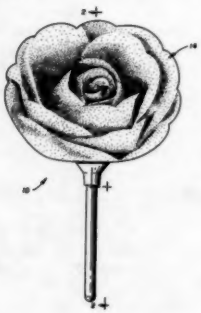
PEN AND NOTE PAD

Daniel P. Leahan, 1420 S. Bayshore Dr. Apt. 402, Miami, Fla. 33131

Filed Aug. 21, 1986, Ser. No. 898,901

Int. Cl.[4] B42D *5/00;* **G09F** *1/00;* **B65D** *27/00*

U.S. Cl. 281—15 B **9 Claims**



1. A combination note pad and writing implement holder comprising a base member having a planar portion provided with shaped top, side and bottom perpheral portions, a portion of the bottom periphery being provided with a substantially straight area, implement receptacle means being integrally formed with said base member and extending outwardly from said bottom peripheral portion, a note pad comprised of a plurality of sheets of paper, said note pad having an outer peripheral shape substantially identical to the peripheral shape of said base member, means for adhering said note pad to said base and an implement received within said receptacle means so that said implement extends outwardly away from said base member.

4,678,207

CONNECTOR ASSEMBLY FOR A WATER-DISPENSING FIXTURE

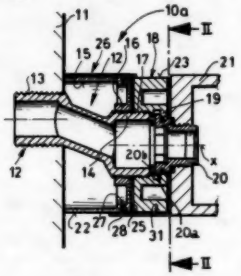
Helmut Dornbracht, and Klaus-Peter Grasse, both of Iserlohn, Fed. Rep. of Germany, assignors to Aloys F. Dornbracht GmbH & Co., Iserlohn, Fed. Rep. of Germany

Filed Dec. 27, 1985, Ser. No. 814,108

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1984, 3447802

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—39 **10 Claims**



1. A connector assembly for a water-dispensing fixture wherein at least one connecting fitting is to be joined to an inlet fitting of said fixture, said assembly comprising:

a collar threaded onto an end of said connecting fitting and adapted to bear upon a wall around said connecting fitting;

a nut threaded onto said end of said connecting fitting for joining said inlet fitting thereto, said nut having flats enabling the engagement thereof by a wrench, said nut and said collar having axially aligned cylindrical surfaces of the same diameter;

an apron axially shiftable on said nut and said collar and having a surface close fitting to said cylindrical surfaces and of an axial length greater than that of said nut and less than the total length of said nut and said collar, whereby said apron can be shifted axially in one direction on said cylindrical surfaces to expose said flats and in the opposite axial direction to completely cover said nut; and

means for retaining said apron relative to said nut at least in a position of said apron in which said nut is covered by said apron.

4,678,208

GASKET FOR SEGMENTED PIPE COUPLINGS

Peter G. De Raymond, Nazareth, Pa., assignor to Victaulic Company of America, Easton, Pa.

Filed Oct. 7, 1986, Ser. No. 916,277

Int. Cl.[4] F16L *21/06*

U.S. Cl. 285—112 **8 Claims**

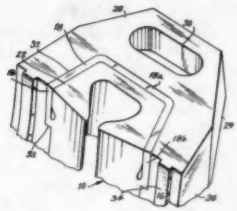
1. A symmetrical elastomeric gasket segment for a segmented pipe coupling, comprising:

a said gasket segment formed from an elastomeric material and having a circumferential length greater than that of the coupling segment with which it is to be employed;

a flange providing a reaction member adjacent each end of said gasket segment and extending outwardly therefrom for engagement with a corresponding shoulder of a said coupling segment;

a skirt portion integral with said flange and extending spaced from the adjacent end of said gasket segment to define an open channel;

the ends of said gasket segment being retractable and displaceable into the associated said skirt portions under



compressive loading of the associated end face of said gasket segment against the reaction provided by said flange;

the extent of compressive loading at said end faces being determined by the spring forces stored in said end portions upon the retraction and displacement thereof.

4,678,209

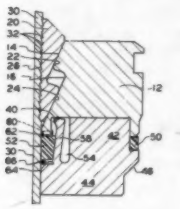
CASING HANGER

Walter L. Guice, Houston, Tex., assignor to Vetco Offshore, Inc., Ventura, Calif.

Filed Oct. 21, 1985, Ser. No. 789,681

Int. Cl.[4] F16L *21/00*

U.S. Cl. 285—144 **12 Claims**



1. An improved casing hanger for suspending an inner pipe string or the like from an interior seat of a casing head comprising:

a slip bowl forming an exterior seat for engaging the interior seat of a casing head and forming an inner wedging surface defining a central opening therein;

slip means disposed in circumferentially spaced relation about said opening and forming a central bore for wedging movement downwardly and inwardly with respect to said wedging surface into engagement with the exterior of a pipe string disposed in said bore to support the pipe string therein, said slip means comprising a plurality of slip members having an inner surface with a series of teeth engageable into a pipe string disposed in said bore and having an opposing outer surface with a second series of teeth engageable with the slip bowl wedging surface, said second series of teeth having a tapered tooth profile wherein said teeth protrude at an increasing radial distance from said outer surface in accordance with the distance from a central outer surface portion of said slip member.

4,678,210

LOADING AND LOCKING MECHANISM

Peter J. Balsells, 17592 Sherbrook Dr., Tustin, Calif. 92680, assignor to Peter J. Balsells and Joan C. Balsells, both of Tustin, Calif.

Filed Aug. 15, 1986, Ser. No. 896,722

Int. Cl.[4] F16L *39/00*

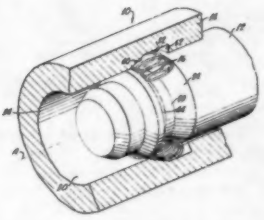
U.S. Cl. 285—318 **14 Claims**

1. Loading and locking mechanism comprising:

a first cylindrical member including means defining a circumferential groove therein, said circumferential groove including a first surface of revolution disposed at an angle with the axis of said first cylindrical member;

a second cylindrical member including means defining an axial opening sized to accommodate said first cylindrical member, said second cylindrical member including means defining a groove in an inside surface of said second cylindrical member, the inside surface groove including a second surface of revolution disposed at an angle with the axis of said second cylindrical member;

spring means disposed in both the first and second cylindrical member grooves for forcing said first and second



surfaces of revolution away from one another to cause an axial loading between the first and second cylindrical member; and,

locking means for preventing separation of the first and second cylindrical member by movement of the first and second surfaces of revolution away from one another, said locking means comprising a first locking surface in said circumferential groove disposed in a plane approximately perpendicular to the axis of the first cylindrical member and a second locking surface in the inside surface groove disposed in a plane approximately perpendicular to the axis of the second cylindrical member.

4,678,211

JOINTS FORMED WITH WELDED FLANGE PIPES

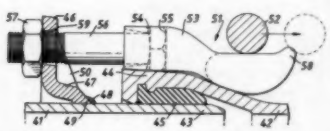
Terence Bateman, Chesterfield, and William W. Stevens, Ilkeston, both of England, assignors to Stanton and Staveley Limited, United Kingdom

Filed Jul. 30, 1985, Ser. No. 760,472

Claims priority, application United Kingdom, Aug. 10, 1984, 8420328; Feb. 27, 1985, 8505030

Int. Cl.[4] F16L *21/02*

U.S. Cl. 285—368 **6 Claims**

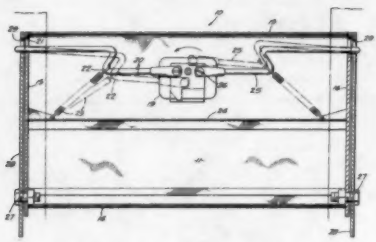


1. A joint formed with a welded flange pipe wherein a spigot of one pipe, provided with a spigot flange welded thereto, is disposed in a socket of another pipe having a socket flange assembly located thereabout, the spigot flange and the socket flange assembly being connected by holding members linked therebetween, the socket flange assembly being in the form of a continuous ring of larger diameter than the socket together with a plurality of shoes, each connectable with the spigot flange, spaced around the ring and located between the ring and the socket such as to bear, when connected to the spigot flange, against the socket.

4,678,212
TAILGATE LATCH MECHANISM

Richard Rubio, 3708 Missouri Ave., W. Covina, Calif. 91792

Filed Mar. 3, 1986, Ser. No. 835,649
Int. Cl.[4] E05C *5/02*
U.S. Cl. 292—7 **4 Claims**



1. A latch mechanism for releasably securing a tailgate in closed condition to a truck bed, comprising:

a tailgate pivotally mounted to swing from a closed position to an open position, said tailgate having a top edge, bottom edge and two opposite sides;

a handle rotatably mounted on the tailgate and having parts unitarily rotatable with the handle;

a swivel plate affixed to the handle parts for rotation therewith;

first and second rods pivotally connected to the swivel plate at opposite sides of the handle parts and having end portions respectively resting on first and second support means at the respective tailgate opposite sides such that an end portion of each rod extends outwardly of said tailgate opposite sides;

spring means for resiliently biasing the rods toward the tailgate bottom edge and toward the respective adjacent side; and

first and second locking plate means fixedly located respectively adjacent the tailgate sides, said locking plate means each including an opening that receives the end portions of the rods therein when the tailgate is in closed condition and each said locking plate means opening has an open access including an upwardly slanted ramp which swings the outer end portions of the rods up the ramp on the tailgate being moved from open to closed.

4,678,213
LOCKING APPARATUS

Larry R. Brasuell, 1798 E. Nees, Fresno, Calif. 93710, and Clayton E. Olson, 2666 W. San Jose, Fresno, Calif. 93711

Filed Feb. 11, 1985, Ser. No. 700,028
Int. Cl.[4] E05C *9/02*
U.S. Cl. 292—37 **4 Claims**

1. A locking apparatus comprising,

A. a housing having upper and lower portions, said upper portion defining an elongated channel dimensioned to be received about the lower edge portion of the door and said lower portion of the housing having a base mounting upright portions defining a channel therebetween and said base having a plurality of circular apertures extending therethrough;

B. a guide cylinder assembly including a guide cylinder mounted in axially upright attitude on the base within the channel between said upright portions in alignment with each of said apertures and a helical compression spring loosely fitted about each of said guide cylinders;

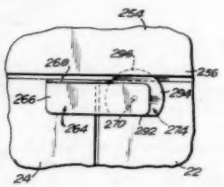
C. a locking element received for slidable movement within each guide cylinder, each of said locking elements having a body dimensioned for substantially close fitting slidable movement axially within its respective guide cylinder and a bolt secured on the body and extending through and securing an annular flange on the body for compressibly engaging the helical compression spring extending about the guide cylinder; and

D. an actuating assembly for reciprocal slidable movement in the channel, defined by said upright portions of the lower portion of the housing, between a first position and a second position, the actuating assembly including a plurality of serial interconnected actuating members each having an oblique portion extending obliquely downwardly for engagement with an individual locking element, said actuating assembly, upon movement of the first position, causing each oblique portion to engage the bolt of each locking element to urge the body thereof to extend externally of the lower portion of the housing to a locked attitude and, upon movement to the second position, moving each oblique portion to permit each helical compression spring to urge the body of each locking element to a retracted position substantially completely internally of its respective guide cylinder in an unlocked attitude.

4,678,214
SURGICAL CASE CART

Robert J. Cohn, Dallas, Pa.; Frank C. Olsson, East Lyme, Conn.; James W. Holzman, New Tripoli, and Paul Santarelli, Hudson, both of Pa., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Division of Ser. No. 354,762, Mar. 4, 1982, Pat. No. 4,550,956.
This application Jul. 5, 1985, Ser. No. 752,099
Int. Cl.[4] E05C *3/10*
U.S. Cl. 292—213 **4 Claims**



1. A cart comprising:

an enclosed container having a pair of adjacent first and second front door panels with an overlying top wall, said top wall having a depending lip;

latching means having two distinguishably different closed positions including a first closed position for locking at least said first front door panel and a second closed position for locking both of said front door panels;

said latching means having an open position for permitting opening of both of said front door panels;

said latching means including a plate member rotatably coupled to said first front door panel;

said plate member having a cut off section and at least first and second laterally extending engagement portions for engaging said top wall lip to prevent opening of said first front door panel;

handle means secured to said plate member for selectively rotating said plate member into one of said closed and open positions;

said handle means extending outwardly from said plate member in a direction parallel to a free edge of said cut off section of said plate member;

said open position being provided when said free edge of said cut off section of said plate member and a longitudinal edge of said handle means extend along said first front door panel and are disposed horizontally adjacent to a top edge of said first front door panel;

said first closed position being provided when said handle means is rotated 90 degrees from said open position so that said first engagement portion of said plate member engages behind said top wall lip; and

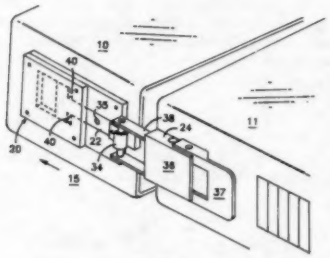
said second closed position being provided when said handle means is rotated 180 degrees from said open position so that said second engagement portion of said plate member engages behind said top wall lip and said handle means extends in front of said second front door panel to prevent opening of said second front door panel.

4,678,215

SAFETY LATCHING ASSEMBLY FOR ELECTRONICS EQUIPMENT WITH EXTERNAL BATTERY PACK

Clayton J. Rehbein, Chandler, and Leland B. Battin, Jr., Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 19, 1986, Ser. No. 864,241
Int. Cl.[4] E05C *5/02*
U.S. Cl. 292—247 **8 Claims**



1. In conjunction with portable and/or remote electronics equipment having an external battery pack sealingly attached thereto, a safety latching assembly comprising:

a guide frame fixedly attached to a side of one of the battery pack and the electronics equipment, said guide frame defining a central opening with a predetermined width and side portions defining an exit with a reduced width, the exit being directed generally toward the other of the battery pack and the electronics equipment;

a strike plate having a elongated body with a width smaller than the reduced width of the exit and with an enlarged portion having a width larger than the exit and smaller than the central opening adjacent one end thereof and a clasp portion adjacent an opposite end thereof, the elongated body being slideably engaged in the exit of the central opening of said guide frame with the enlarged portion being positioned in the central opening and the clasp portion being positioned outside the exit of the central opening, said strike plate being slideable between a first position in which the enlarged portion of the elongated body is spaced into the central opening from the side portions of the guide frame and a second position in which the enlarged portion of the elongated body is in abutting engagement with the side portions of the guide frame;

a shear pin extending transversely through said strike plate and holding said strike plate in the first position; and

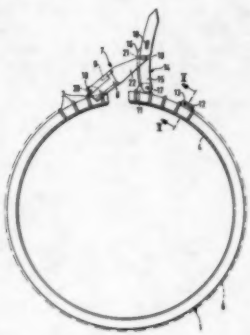
a catch mounted on the other of the battery pack and the electronics equipment so as to be engaged with the clasp portion of the elongated body of said strike plate, said catch including a cam acting lock having open and locked positions, said catch being mounted to draw said strike plate toward said catch in the locked position and thereby seal the battery pack and electronics equipment together.

4,678,216

THERMOPLASTIC CLAMPING RING

Dieter Gregory, Attendorn, Fed. Rep. of Germany, assignor to Theodor Schemm, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,795
Int. Cl.[4] E05C *17/54*
U.S. Cl. 292—256.69 **4 Claims**



1. A clamping ring for clamping covers on barrels and having a U-shaped cross-sectional configuration and two ends, and provided with a clamping lever with spaced flanges pivotally connected to one end of the clamping ring, and a clamping link with spaced flanges which is both pivotally connected to the other end of the clamping ring and pivotally connected to the flanges of the clamping lever, which clamping ring comprises:

(a) a plurality of reinforcing ribs circumferentially spaced around the exterior of the clamping ring and disposed in parallel with the central axis of the clamping ring;

(b) the clamping ring including a pair of inner peripheral edges, with each edge terminating in an outwardly directed ring bead;

(c) the reinforcing ribs extending around the exterior of the clamping ring to the ring beads;

(d) a hook-shaped pivot eye carried on each end of the clamping ring;

(e) a pivot bolt disposed through each pivot eye;

(f) the clamping lever being pivotally connected to one pivot eye by a corresponding pivot bolt and the clamping link being pivotally connected to the other pivot eye by a corresponding pivot bolt; and

(g) one pivot eye being disposed between a corresponding pair of spaced flanges of the clamping lever and the other pivot eye being disposed between a corresponding pair of spaced flanges of the clamping link.

4,678,217

CARRIER TOOL

Frank J. Viola, Uniondale, and Henry H. Hubner, Jr., Levittown, both of N.Y., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 625,889, Jun. 29, 1984, abandoned. This application May 6, 1986, Ser. No. 861,116
Int. Cl.[4] B65G *7/12*; B66C *1/44*
U.S. Cl. 294—16 **6 Claims**

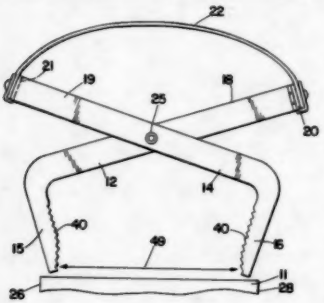
1. A tool for carrying an automotive battery and the like, comprising:

a pair of levers, each of said levers having a gripping jaw at one end and a handle at the other end, each of said levers being formed of a rigid plate wherein each said jaw lies

substantially in a common plane with said respective lever;

means connecting said pair of levers at a single pivot location between said jaw and handle in side by side disposition for pivotal movement of said jaws toward and away from one another, said jaws extending at substantially a right angle relative to said respective levers, and having respective confronting inner faces formed of the edge of said respective jaw transverse to the plane of and adjacent said lever, said levers being connected with said handle of each said lever adjacent said jaw of the other said lever so that said levers may be moved to a substantially parallel, side by side disposition with said jaws extending substantially parallel to one another in a fully spaced disposition adapted for placement adjacent the sides of said automotive battery;

gripper means in a convex curvature extending along a



portion of said inner face of each of said jaw, each said gripper means being curved substantially in the plane formed by said respective jaw and lever, each said gripper means comprising a plurality of teeth distributed along said respective inner face, whereby as said jaws are pivotally moved toward and away from one another, different teeth of said gripper means will become operatively opposed, at different spacings from one another, for gripping purposes, said gripper means extending transversely substantially no further than the thickness of said plate to provide the sole means for gripping engagement of said automotive battery; and

means biasing said jaws toward one another for gripping the sides of an automotive battery therebetween, said biasing means comprising a semi-rigid strap fixedly attached to said handles of said levers in a manner to urge said jaws to a partially closed position and serving as a handle for said tool.

4,678,218

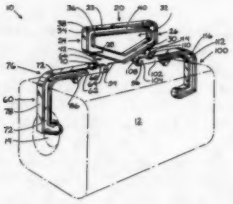
SALT BLOCK CARRIER

Lowell C. Babcock, 22014 Anthony Rd., Marengo, Ill. 60152

Filed Jun. 6, 1986, Ser. No. 871,375

Int. Cl.[4] B65G 7/12

U.S. Cl. 294—16 **18 Claims**



1. A salt block carrier for holding a salt block including a handle, and a first movable arm secured to said handle and a second movable arm secured to said handle, wherein:

a. said first movable arm includes a first securing end for movably securing said first movable arm to said handle;

b. said first movable arm includes a first knobbed end for contacting said salt block oppositely disposed from said first securing end;

c. said second movable arm includes a second securing end for movably securing said second movable arm to said handle;

d. said second movable arm includes a second knobbed end for contacting said salt block oppositely disposed from said second securing end;

e. a first release means for releasing said first movable arm from said salt block;

f. a second release means for releasing said second movable arm from said salt block;

g. said handle includes a grip area, said grip area being generally the portion of said handle in contact with a hand of a person using said salt block carrier;

h. a first handle side is at one end of said grip area;

i. a second handle side is oppositely disposed from said first handle side at an opposing end of said grip area;

j. said grip area extends into said first handle side and said second handle side;

k. said first handle side extends into a first handle base;

l. said second handle side extends into a second handle base;

m. said first handle base and said second handle base meet to complete said handle in cooperation with said first handle side, said second handle side, and said grip area;

n. said handle has a handle exterior and a handle interior oppositely disposed from said handle exterior;

o. said first handle base includes a first base arm mount on said handle exterior; and

p. said second handle base includes a second base arm mount on said handle exterior.

4,678,219

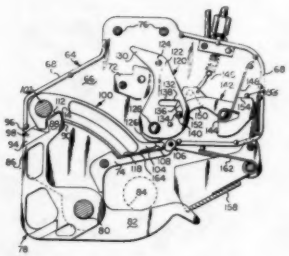
HELICOPTER CARGO HOOK

Donald E. Smith, Delphos, and Greg A. Haunhorst, VanWert, both of Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Filed May 14, 1986, Ser. No. 863,059

Int. Cl.[4] B66C 1/34

U.S. Cl. 294—82.33 **4 Claims**



1. In a cargo hook including a support, a load arm pivotally mounted on the support pivotal about an axis between a closed load supporting position and an open load releasing position, a first abutment surface defined on the load arm radially spaced from the arm pivot axis, a latch arm pivotally mounted on one end on the support on an axis parallel to the load arm axis and having a free end, a second abutment surface defined on the latch arm adjacent the pivotally mounted end thereof, said latch and load arms having a coincident plane of operative movement, the latch arm being pivoted between a first position

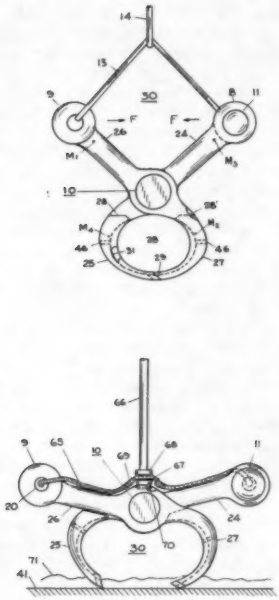
whereby the first abutment engages the second abutment preventing pivoting of the load arm from the closed load supporting position to the open load releasing position, and a second position disengaging the first and second abutments permitting the load arm to pivot to the open position, a latch pivotally mounted on the support on an axis substantially parallel to the load arm axis engagable with the latch arm free end at a first latch position maintaining the latch arm in the first position thereof and releasing the latch arm at a second latch position for permitting movement of the latch arm to its second position, a cam slot defined in the latch having an end, a lock arm lever pivotally mounted upon the support pivotal about an axis substantially parallel to the latch pivot axis, a cam slot follower mounted upon the lock arm lever received within the latch cam slot, pivotal movement of the lock arm lever in a first direction pivoting the latch toward its first position and pivotal movement of the lock arm lever in a second direction pivoting the latch toward its second position, and operating means connected to the lock arm lever for pivoting the lock arm lever about its pivot axis to translate the cam follower within the cam slot and pivot the latch between its first and second positions, the improvement comprising, stop means mounted on the support engaging the lock arm lever when pivoting in its first direction to locate the cam follower in spaced relationship to the cam slot end when the latch is in its first position.

4,678,220

SHOVEL-LIKE COUPLING DEVICES WITH AUTOMATIC MATERIAL HANDLING FEATURES

Edwin Z. Gabriel, 91 Mt. Tabor Way, Ocean Grove, N.J. 07756

Filed Feb. 14, 1986, Ser. No. 830,211
Int. Cl.[4] B66C *1/38, 3/10*
U.S. Cl. 294—118 **4 Claims**



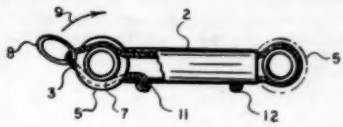
1. An automatic, tongs-like materials' scooping and unloading device, comprising a tong-like structure having two elongated members and having upper and lower portions, pivoted near their midsections with a pivot pin, for use with hoist cables being adapted for attachment to said upper portions of said structure, and a load cable, said upper portions having additional weights attached, said lower portions being sharply curved toward each other and having ends that are forced into contact with each other as a result of the tension on said hoist cables, to scoop up a load cable attached to a load to transport said load, said ends being sharp-edged and overlapping to facilitate the picking up of said cable; said ends having arcuate mating surfaces, one being concave and the other convex, said convex and concave surfaces being adapted to mate with each other, said surfaces having the same radius of curvature, so that said concave and convex surfaces enable said lower portions to share the stresses being imposed on said pivot pin, said stresses being caused by the lateral swinging motions of said scooping device under load-suspended, wind-gust conditions, whereby said lower portions will separate automatically when said tension in said hoist cables is significantly reduced, thus enabling said load to be discharged; said tension on said hoist cables being caused by said additional weights placed on the upper portions of said elongated members.

4,678,221

CARRYING HANDLE FOR TWO BOTTLES HAVING BUILT IN CARRYING LIPS

Frederick G. Josenhans, 14020 Netherfield Dr., Midlothian, Va. 23113

Filed Dec. 4, 1985, Ser. No. 804,525
Int. Cl.[4] B65D *23/10, 71/00*
U.S. Cl. 294—170 **2 Claims**



2. A device for removably securing and carrying two beverage bottles having identical annular carrying flanges which extend outwardly from a narrow neck, said device comprising:

(a) a substantially rigid tube handle having two opposed extremities, and two apertures in the wall of said tube handle, and

(b) a substantially non-elongatable cord positioned within and extending the entire length of said tube handle and protruding from each extremity as a loop whose size is self-adjusting by virtue of movement of the cord axially within said tube handle between said extremities to cause equal but opposite size change in the opposite loop, the length of said cord relative to the length of said tube handle being such that when one of said loops is in tight-fitting contact with the neck of one bottle below its flange, the size of the opposite loop is adequate to make tight-fitting passage over the carrying flange of the other bottle, said cord having two ends, each end passing from the interior of said tube handle to the exterior thereof through one of said apertures and being anchored upon the exterior of said tube handle.

4,678,222

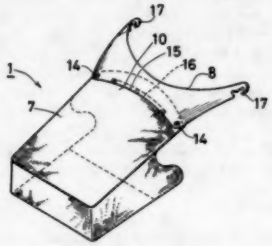
FRONT COVER FOR BABY CARRIAGES

Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Jun. 2, 1986, Ser. No. 869,577
Claims priority, application Japan, Jul. 19, 1985, 60-111292[U]
Int. Cl.[4] B60J *9/00*
U.S. Cl. 296—78 A **6 Claims**

1. A front cover for a baby carriage having a seat with a seating surface on which to place a baby and a back rest extending approximately upwardly from said seating surface, said front cover serving to cover the lower half of a baby's body placed on the seat, said front cover comprising a front

cover body defining a space between itself and said seating surface for receiving the lower half of a baby's body, said front cover body having a first end edge region facing toward said back rest and a second end edge facing away from said back rest, a shape retaining member made of a material of relatively high stiffness, and means securing said shape retaining member to an upper surface of said first end edge region of said front



cover body along an arc normally bulging toward said second end edge away from said back rest, whereby said shape retaining member is normally in a resting position flat on said front cover body, said securing means permitting said shape retaining member to be turned out of said resting position into an operative position in which said shape retaining member causes said front cover body to form an upward bulge at least of said first end edge region to open said front cover for easy access.

4,678,223

COWLING DEVICE FOR RIDING TYPE VEHICLES

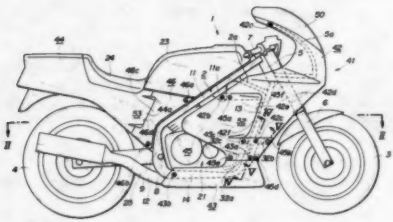
Toshiaki Kishi, and Mitsuyoshi Kohama, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,655

Claims priority, application Japan, Dec. 26, 1984, 59-199547[U]

Int. Cl.⁴ B62J *17/02*; B60K *11/08*

U.S. Cl. 296—78.1 **6 Claims**



1. A cowling device for a riding type vehicle having a vehicle frame, said cowling device covering said frame and comprising:

a forward cowling unit defining a first air intake opening and trailing lateral cut-out portions;

a pair of cowl panels disposed rearwardly of the forward cowling unit and attached thereto, said attached panels at forward edges thereof defining a second air intake opening smaller than said first opening;

said second opening spaced transversely inwardly of the respective cut-out portions; and

each forward edge of the cowl panel and a respective trailing cut-out portion defining an air exit opening therebetween.

4,678,224

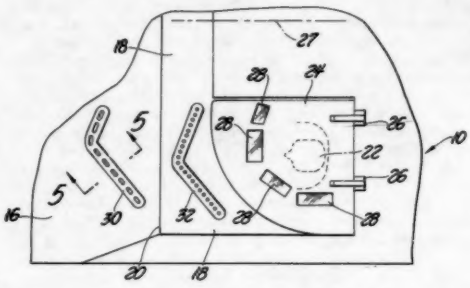
PREVENTION OF PARTICULATE ACCUMULATIONS ON OBSERVATION WINDOWS IN MILITARY VEHICLES

Erwin F'Geppert, 27563 Meadowbrook, Novi, Mich. 48050

Filed May 6, 1985, Ser. No. 730,413

Int. Cl.⁴ B60J *1/20*

U.S. Cl. 296—91 **1 Claim**



1. In a military tracked vehicle comprising a hull having a longitudinal axis; said hull including an upper wall having a hatch opening therein enabling a human driver to enter or leave the vehicle, a movable cover for the hatch opening, and a number of vision blocks mounted in the cover for enabling the human driver to view the terrain in the forward path of the vehicle; said hatch opening and associated cover being offset laterally from the vehicle's longitudinal axis, so that when the vehicle is moving in a forward direction airborne particulates generated by one of the vehicle tracks tend to be concentrated in zones in the path taken by the hatch cover; at least some of the vision blocks having external surfaces thereof facing in a forward direction, whereby there is a danger that airborne particulates in the path of the vehicle will impinge on external surfaces of the vision blocks: the improvement comprising means for preventing airborne particulates from impinging on the vision block surfaces while the vehicle is moving in the forward direction; said prevention means comprising a tube-like manifold secured to the hull upper wall in an area thereof directly forward from the hatch cover; said manifold having a V-shaped configuration when looking downwardly onto the hull surface; a gas pressure source within the vehicle, conduit means extending between the gas pressure source and the tube-like manifold for supplying pressurized gas to the manifold; a series of gas discharge nozzle openings extending along the manifold for discharging pressurized gas upwardly away from the hull surface; said nozzle openings being sufficiently close together that the discharged gas forms a substantially continuous pressurized gas curtain in the space forwardly of the aforementioned vision blocks; said gas curtain being operable to apply upwardly-acting forces on particulates encountered by the curtain; said V-shaped manifold having a length, measured normal to the hull longitudinal axis, that is approximately the same as the lateral dimension of the hatch cover, whereby the pressurized gas curtain has sufficient length to substantially completely shield the vision blocks from airborne particulates; said tube-like manifold being physically engaged by an upper exposed face of the hull such that it is not likely to be deformed or broken should a soldier step thereon when entering or leaving the vehicle through the hatch opening; said manifold being spaced forwardly from the hatch cover by a distance that is greater than one foot and less than three feet, whereby there is sufficient space between the gas curtain and vision block surfaces so that deflected particulates have enough time to escape from the path taken by the vision blocks; the V-shaped configuration of the manifold being such that the gas curtain exerts lateral force components on the encountered particulates.

4,678,225

COVERED GOODS TRUCK, IN PARTICULAR SILO TRUCK

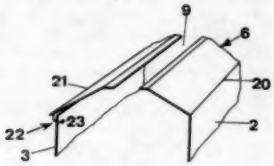
Antal Ritzl, Zurich, and Jürg Zehnder, Uitikon, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis

Filed May 8, 1986, Ser. No. 861,091

Claims priority, application Switzerland, May 15, 1985, 2086/85

Int. Cl.[4] B62D *33/00*

U.S. Cl. 296—181 19 Claims



1. Covered goods truck which comprises a silo truck superstructure made up of interconnected longitudinal walls, end walls and floor designed as a self-supporting body that twists relatively easily, a roof covering said superstructure including at least one longitudinal part which is attached to one of said longitudinal walls and, with respect to the end walls and the other of said longitudinal wall, exhibits freedom of movement in the longitudinal direction which accommodates the twisting action while the truck is in motion.

4,678,226

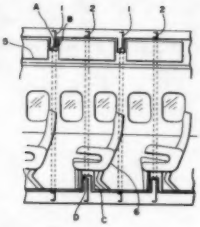
CONSTRUCTION OF VEHICLE BODY

Masashi Ishizuka, and Makoto Ogawara, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 657,539, Oct. 4, 1984, abandoned. This application Nov. 20, 1986, Ser. No. 933,274

Int. Cl.[4] B62D *31/02;* B60N *1/04;* B61D *17/00*

U.S. Cl. 296—203 2 Claims



1. An elongated vehicle body of substantially square cross-sectional shape comprising: a plurality of transverse frames; a plurality of longitudinal structural members located at right angles to said frames to connect said transverse frames together; and a shell attached and secured to outer surfaces of said frames and of said longitudinal structural members, said plurality of frames comprising a plurality of substantially square first and second frames, each first frame having relatively large radius inwardly projecting portions for reinforcing each first frame at two upper corners thereof and a relatively small radius at each of two lower corners thereof, each second frame positioned between adjoining first frames and having relatively large radius inwardly projecting portions for reinforcing each second frame at two lower corners thereof and a relatively small radius at each of two upper corners thereof, said upper corner small radii being such located respectively vertically above a passenger seat, and said lower corner small radii being each located respectively between adjoining passenger seats to provide increased space for the accommodation of passengers.

4,678,227

WEATHER STRIP FOR A MOTOR-VEHICLE

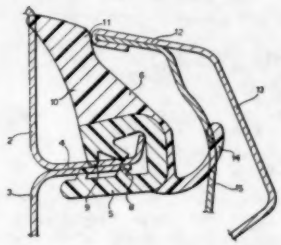
Aldo Castagno, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Division of Ser. No. 761,722, Aug. 2, 1985, abandoned. This application Sep. 11, 1986, Ser. No. 906,687

Claims priority, application Italy, Aug. 2, 1984, 67768 A/84

Int. Cl.[4] B60J *5/04*

U.S. Cl. 296—213 2 Claims



1. A motor vehicle having a body portion with at least one door opening in each side thereof, a roof having a top portion, a downwardly extending side portion on each side thereof and an outwardly extending flange along each side portion which defines a drip channel above each door opening, a door hinged to said body in each opening with an inwardly extending upper edge portion overlying said flange in the closed position of the door in substantially flush relation with said top portion and a sealing member for the top edge of each door comprising a first channel-shaped portion of semi-rigid material having an upper surface, an end surface and a lower surface mounted on said outwardly extending flange and a second soft, solid rubber portion secured to said upper and end surfaces of said first portion and having a first projection with an upwardly tapered substantially trapezoidal cross section extending upwardly and inwardly from said upper surface of said channel-shaped portion wherein the uppermost end portion of said first projection is formed with a protruberance adapted to be engaged between the top edge of said door and said side portion of said roof adjacent said top portion to provide an upper surface which is substantially flush with said top portion of said roof and said upper edge portion of said door and having a second projection extending laterally outwardly and upwardly from said end surface of said channel-shaped portion for engagement by the inner surface of said door in the closed position.

4,678,228

SLIDING ROOF FOR A VEHICLE

Robert T. Boots, Haarlem, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., Netherlands

Filed Nov. 20, 1985, Ser. No. 800,051

Claims priority, application Netherlands, Dec. 6, 1984, 8403710

Int. Cl.[4] B60J *7/047, 7/185*

U.S. Cl. 296—216 10 Claims

1. A sliding roof for a vehicle having a fixed roof with a roof opening therein which opening has front and rear edges and spaced lateral sides, comprising:

a panel having a first forward closed position closing the roof opening and a second rearward, upwardly and rearwardly inclined position, in which the panel partially overlaps the fixed roof, the panel being movable between said first and second positions;

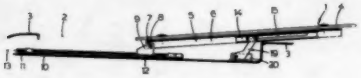
means defining first and second slots on the lower side of the

panel, said slots having surfaces that are generally parallel to the panel and extend in direction from front to rear;

a latch pin mounted on the means defining and protruding into the second slot adjacent a rearward end of the second slot;

a front support mounted to be movable backwardly and forwardly in the longitudinal direction of the vehicle and having means for pivotally mounting the panel thereon; and

a lever disposed rearwardly of the front support, the lever having upper and lower ends and being pivotally supported at its lower end about a transverse pivot axes, the lever having at least first, second and third guide elements formed at the upper end thereof, said first guide element comprising a transverse pin pivotally and slidably engaged in the first slot, and the second guide element being a protrusion formed on an opposite side of the lever from the transverse pin, the protrusion permanently engaging in the second slot as the panel moves between its first and second positions, said second slot extending rearwardly at least as far as the first slot, the protrusion comprising a part circular wall of complemental shape to the latch pin, said part circular wall fitting around said latch pin to prevent rearward movement of the panel relative to the upper end of the lever with the lever in a first lever position when the panel is adjacent its first position, said protrusion moving to a position to release the latch pin for rearward movement of the panel toward its second position when the lever has been pivoted to a second lever position.



4,678,229

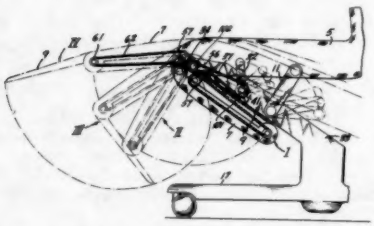
RECLINING CHAIR

James M. Ryan, New York, N.Y.; Sanford S. Golden, Palm Springs, Calif., and Larry Sliker, Newton, N.J., assignors to Henry Dreyfuss Associates, New York, N.Y. and Golden Associates, Palm Springs, Calif.

Filed Mar. 25, 1986, Ser. No. 843,575

Int. Cl.[4] A46C *1/02*

U.S. Cl. 297—68 **4 Claims**



1. A reclining chair, comprising:

a seat shell having a seating portion and a back portion;

seat support means for supporting said seat shell at an elevation, said seat support means having a diagonal component extending upwards beneath said seat shell towards a forward edge of said seat shell and forming an acute angle therewith;

first crank means, secured at an upper end about a first point on the seating portion of said seat shell and pivotally secured at a lower end to a first pivot point located on said diagonal component;

said seat shell being disposable in degrees of recline between an upright orientation and a full recline orientation relative to said seat support means, said crank means pivoting about said first pivot point in degrees relative to the degree of recline of said seat shell;

a leg support portion rotatably extendable in degrees about the forward edge of said seat shell, wherein said leg support portion includes a legrest and a footrest, said footrest being rotatably extendable in degrees about a forward edge of said legrest, a second pivot point being provided substantially about a rearward edge of said leg support portion and in proximity to the forward edge of said seat shell, said leg support portion pivoting about said second pivot point;

first belt drive means including a first endless belt revolving about said lower end of said first crank means and said second pivot point, drivingly pivoting said leg support portion in degrees about said second pivot point in response to the pivoting of said crank means and relative to the degree of pivot of said crank means and thereby rotatably extending said leg support portion about the forward edge of said seat shell, said first crank means driving said first endless belt;

second belt drive means including a second endless belt revolving between a point located substantially about the rearward edge of said legrest and a third pivot point provided substantially about a rearward edge of said footrest for drivingly pivoting said footrest in degrees about said third pivot point and thereby rotatably extending said footrest about said forward edge of said legrest; and

belt drive engagement means cooperating with said first and second belt drive means for engaging said second endless belt relative to the degree of pivot of said first crank means and the resultant revolving of said first endless belt.

4,678,230

BACK SUPPORT MEANS

Graeme J. Winkle, 395 Brisbane Corso, Yeronga, 4104, Brisbane, Queensland, Australia

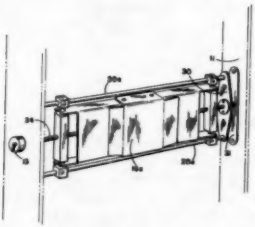
PCT No. PCT/AU84/00197, § 371 Date Jun. 28, 1985, § 102(e) Date Jun. 28, 1985, PCT Pub. No. WO85/01644, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 10, 1984, Ser. No. 760,746

Claims priority, application Australia, Oct. 14, 1983, PG1842

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—284 **8 Claims**



1. A back support mechanism for a backrest of a chair mountable between two spaced side rails of a chair, said mechanism including:

adjustable support means including laterally disposed link members, each said link member having an upper and a lower arm, said support means further including two guide posts, said arms of each said link member engaging with a respective said guide post at spaced locations therealong, said arms being formed on an end portion of each said link member, each said link member having meshing

projections formed thereon and spaced from said arms such that said meshing projections of said link members engage during operation of the mechanism;

a bearing pad means pivotally secured to said link members adjacent said meshing projections and bridging between said link members;

a pair of spaced guide rails extending between the side rails of the chair, said guide posts being mounted for movement along the guide rails; and,

control means including a screw threaded shaft engaging said guide posts such that rotation of said shaft in one direction causes said guide posts to move towards one another and thereby cause the meshing projections to mesh and move the bearing pad means to an extended position and rotation of said shaft in a direction opposite to said one direction causes said meshing projections to mesh and said bearing pad means to move to a retracted position.

4,678,231

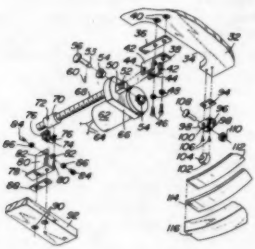
ADJUSTABLE CHAIR

Michael Chizek, Kenosha, Wis., assignor to Contour Chair-Lounge Co., Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 775,853, Sep. 13, 1985, abandoned. This application Mar. 17, 1986, Ser. No. 841,039

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—329 **13 Claims**



1. An adjustable chair comprising:

a seat portion having a convex undersurface, said seat portion including laterally disposed convex side members joined together by a plurality of cross members;

roller means fixed in a spaced apart relation along said convex side members;

a base portion having a concave upper surface, said base portion including laterally disposed concave side members joined together by a plurality of cross members and a plurality of legs affixed to said concave side member;

track means fixed in spaced apart relation along said concave side members; said roller means adapted for rolling engagement along said track means;

power transmission means, a first end of said power means pivotably connected to a cross member of said seat portion, a second end of said power means pivotably connected to a cross member of said base portion, said power means being adapted to move said seat portion along an arcuate path defined by said concave upper surface of said base portion; and

a noise dampening preload means associated with said second end of said power means.

4,678,232

HEADREST ASSEMBLY FOR VEHICLES

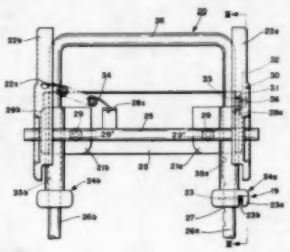
Keiichi Ishida, and Takami Terada, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Apr. 11, 1985, Ser. No. 721,912

Claims priority, application Japan, Apr. 13, 1984, 59-55226[U]

Int. Cl.[4] A47C *1/10*

U.S. Cl. 297—408 **5 Claims**



1. A headrest assembly for vehicles having a seat backrest, comprising:

a headrest;

a stay fixedly secured to the seat backrest and having a pair of leg portions;

guide shoe means slidably mounted on each of said leg portions for slidably supporting said headrest relative to said stay, said guide shoe means including a pair of guide shoes;

a fixed bracket extending between said leg portions and secured to said guide shoe means for sliding relative to said stay with said guide shoes;

a rod rotatably mounted on said fixed bracket;

movable bracket means mounted at opposite ends of said rod for pivotally supporting said headrest;

first locking means connecting said movable bracket means and said fixed bracket for adjusting the position of said movable bracket means relative to said fixed bracket, thereby preventing pivotal movement of said headrest when locked, said first locking means including:

engagement means fixedly secured to said movable bracket means and including a latch having a first series of teeth centered on said rod;

a pawl means rotatably mounted on said fixed bracket for engagement with said latch; and

reversal spring means connecting said pawl means and said fixed bracket means for biasing said pawl means into engagement with or disengagement with said latch; and

second locking means adapted to be mounted on at least one of said guide shoes to engage a corresponding one of said leg portions for regulating the position of said guide shoes relative to said leg portions when raising and lowering said headrest.

4,678,233

ARMCHAIR, PARTICULARLY FOR HANDICAPPED PERSONS, EQUIPPED WITH A DEVICE FOR RAPIDLY LOCKING THE FOOT REST

Jean-Jacques Chabrol, Gironde, and Jean-Pierre Lambert, Indre et Loire, both of France, assignors to Composites Aquitaine S. A. and Etablissements Poirier S.A., both of, France

Filed May 6, 1986, Ser. No. 860,365

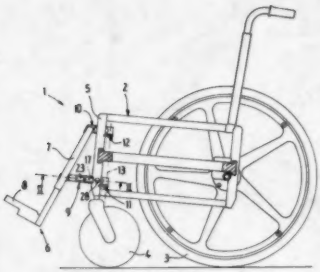
Claims priority, application France, May 7, 1985, 85 06913

Int. Cl.[4] A47C *7/50*

U.S. Cl. 297—429 **5 Claims**

1. In an armchair comprising a frame on which is retractably fixed at least one foot rest which may pivot with respect to said frame about a pin mounted substantially perpendicular to the

bearing plane of said armchair over the ground, said foot rest comprises a locking device cooperating in the service position of the foot rest with one of the uprights of the frame disposed in the path of the foot rest to lock the foot rest against rotation, said locking device comprising a cam mounted for rotation



about said pin and parallel to the axis of said upright said cam having a lateral surface for cooperation with the surface of said upright and means for locking said cam in position cooperating with said one of the uprights of said frame, said means for locking including a locking finger mounted on said foot rest for abutting said cam.

4,678,234

FOOTREST

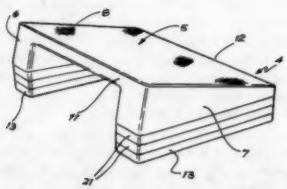
Ian G. Wilson, 17/201 Waterloo Road, Marsfield, New South Wales 2122, Australia

Filed Mar. 17, 1986, Ser. No. 840,520

Claims priority, application Australia, Mar. 20, 1985, PG9821

Int. Cl.[4] A47C *9/12*

U.S. Cl. 297—439 **9 Claims**



1. A footrest comprising a foot member, a body portion composed of moulded thermoplastic material and having a platform integrally formed with a pair of legs depending at opposite sides from said platform and each having a chamfered outer end to support the platform from a floor surface at a downward inclination from a rearward edge to a forward edge thereof, a plurality of spacing pieces having moulded thermoplastic bodies of identical form and having a two-part thread connecting means and a hole, said connecting means and hole equally offset from, and at opposite sides of, a center point of said body, thereby allowing stacking of a selected number of said spacing pieces with one part of said connecting means of one spacing piece passing through said hole of an adjacent spacing piece and receiving the second part of said connecting means for fastening of said spacing pieces together, a projecting stud at the outer end of each of said legs for insertion through the hole in a selected one of said spacing pieces for fastening thereto by a nut, and said foot member detachably connected beneath each of said legs and any selected number of spacing pieces, said spacing pieces detachably connected between each of said foot members and its respective leg.

4,678,235

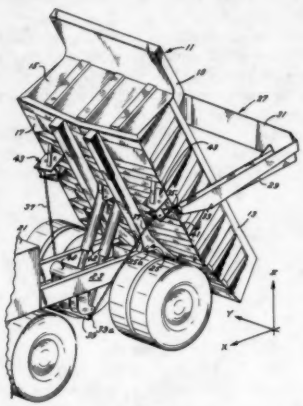
APPARATUS FOR ROTATION OF TAILGATE ASSEMBLY

LeRoy G. Hagenbuch, 4602 N. Rosemead, Peoria, Ill. 61604

Filed Jul. 25, 1983, Ser. No. 759,401

Int. Cl.[4] B60P *1/26*

U.S. Cl. 298—23 DF **8 Claims**



4. A mechanism for rotating a tailgate assembly mounted for rotation on a dump body of a vehicle in response to pivoting of the body about the frame of the vehicle wherein said dump body includes a bottom sheet, two opposing side sheets and a front sheet with said side sheets meeting said bottom sheet at a junction defining side edges of said body, said mechanism comprising:

a pair of roller assemblies, each mounted on the bottom sheet of said dump body adjacent the side edge;

linkage means joining said tailgate assembly to said frame whereby said linkage means is biased away from said side edges by said roller assemblies in a manner so as to create angles in said linkage means that lie approximately in a first plane that is substantially transverse to a second plane which is substantially parallel with said side sheets;

means for pivoting said dump body on said frame;

said linkage means responding to the pivoting of said dump body to generate a torque on said tailgate assembly, thereby causing rotation of said tailgate assembly about said side sheets; and

each of said roller assemblies including means (1) for angling said linkage means in said second plane in addition to said first plane as said body pivots and said tailgate assembly rotates so that said linkage means is biased along the length of said side edge by said means (1) to limit repositioning of the linkage means along the length of the side edge as the body pivots and the tailgate assembly rotates.

4,678,236

APPARATUS FOR WORKING DEPOSITS BY THE OPEN-CAST WORKING PROCESS

Reinhard Wirtgen, Hohner Strasse 2, D-5461 Windhagen, Fed. Rep. of Germany

Filed Jan. 30, 1986, Ser. No. 824,251

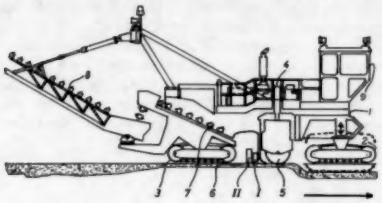
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, 3504610; Feb. 11, 1985, 3504611

Int. Cl.[4] E21C *47/02*

U.S. Cl. 299—1 **20 Claims**

1. Apparatus for working deposits by the opencast working process, with a self-propelled chasis, with a cutting implement mounted with vertical adjustability thereon for cutting away the deposit to a specific depth, and with a loading apparatus for

the material cut away, wherein one or more photosensors, which are provided at the height of the deposit cut away, react



to the light reflected by the deposit and control the vertical setting of the cutting implement.

4,678,237

CUTTER INSERTS FOR PICKS

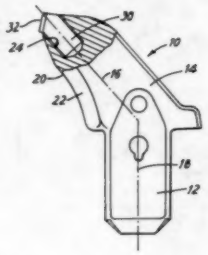
William D. Collin, Sandton, South Africa, assignor to Huddy Diamond Crown Setting Company (Proprietary) Limited, Johannesburg, South Africa

Filed Aug. 5, 1983, Ser. No. 520,594

Claims priority, application South Africa, Aug. 6, 1982, 82/5690

Int. Cl.⁴ E21C *35/18;* **E21B** *10/46*

U.S. Cl. 299—79 **15 Claims**



1. A stud for use in a mining pick comprising

(a) a tip consisting of a polycrystalline diamond composite and having a cutting face and

(b) a body having two ends between which extends an axis, the body comprising a lower portion extending from one end of the body and a carrying surface at the other end of the body on which carrying surface the tip is mounted in which the carrying surface is inclined to the axis of the body by an angle of between 45° and 65°.

4,678,238

COOLANT SLEEVE FOR MINING TOOLS

Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., North Chicago, Ill.

Filed Mar. 17, 1986, Ser. No. 840,155

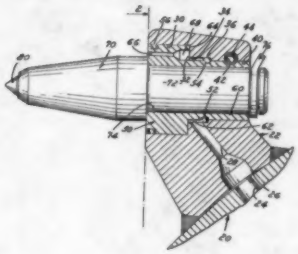
Int. Cl.⁴ E21C *35/22;* **E21F** *5/02*

U.S. Cl. 299—81 **2 Claims**

1. A mining bit mount for standard mining bits for use on a power-driven mining machine with a source of liquid coolant which comprises:

(a) a one-piece, integral, valve-less mounting block to be secured to a moving element of a mining machine, said block having a stepped bore with an outer end to be adjacent the working end of a mining bit and an inner end spaced axially from said outer end, said bore being disposed on a first axis coincident with an axis on which a mining bit is to be mounted, said bore being a stepped passage having the larger end at the outer end, the smaller end at the inner end to provide an annular axial support shoulder between the larger end and the smaller end of the said bore, said block having a coolant passage opening to said stepped bore,

(b) a one-piece, integral, valve-less two-step sleeve fitted within said stepped bore having an axial bore to receive a mounting shank of a cutting bit, and a large end to interfit with said larger end of said stepped bore with a radial shoulder to seat on said annular support shoulder in said block and a smaller end to interfit with said smaller end of said stepped bore, and means between the wall of said



stepped bore of said mounting block and the said sleeve to form an annular unrestricted passage open to said coolant passage in said block,

(c) an axially extending unrestricted passage formed in said sleeve in constant communication with said annular passage having a spray outlet directed axially along the mining bit, and

(d) a retainer means to interfit with a notch in said sleeve to lock said sleeve axially and rotationally in said stepped bore of said mounting block.

4,678,239

FREE WHEEL CAP

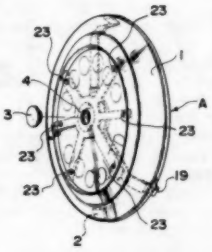
Yutaka Matsushita, 8850-2 Nishi Haruchika, Ina City, Nagano Prefecture, Japan

Filed Sep. 23, 1985, Ser. No. 779,267

Claims priority, application Japan, Sep. 27, 1984, 59-202498

Int. Cl.⁴ B60B *7/04, 7/06*

U.S. Cl. 301—37 N **6 Claims**



1. A hub cap assembly for a vehicular wheel having a curved peripheral rim, comprising a wheel cover having on its front surface advertising material or other indicia and on its back surface a weight, an outer bracket comprising a central annulus from which radially extends a plurality of spokes to the free ends of which the wheel cover is attached, an inner bracket comprising a central boss from which radially extends a plurality of stays and a ball bearing assembly located within the central annulus of said outer bracket and having one race fixedly connected thereto and its other race fixedly connected to the central boss of said inner bracket, each of stays of said inner bracket having at their free ends a V-shaped clip having

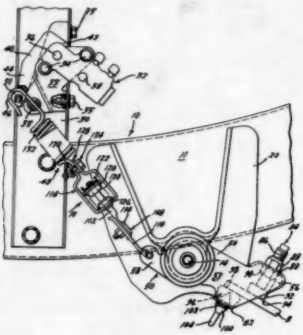
a rounded tip adapted to be inserted within the rim of the vehicular wheel to resiliently secure said inner bracket to said wheel for conjoint rotation therewith and independently of said outer bracket and weighted wheel cover.

4,678,240

REAR SPRING ACTUATED BRAKE PROPORTIONER

James L. Schenten, Sterling Heights, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 27, 1986, Ser. No. 844,659
Int. Cl.[4] B60T *13/04, 8/22*
U.S. Cl. 303—6 C **3 Claims**



1. In a vehicle, a brake and suspension system including a leaf-type rear spring between sprung and unsprung portions of the vehicle with at least one end portion attached to the sprung portion of the vehicle for pivotal movements thereabout, a master brake fluid pressure control means for selectively generating desired levels of brake fluid pressure for transmission to brake components associated with each wheel, a proportioning valve means fluidly connected between the master brake control and the rear wheel brake components to regulate the pressure level of brake fluid transmitted to rear brake components and having a force input thereto responsive to loading of the vehicle for controlling the proportioning valve and including an improved vehicle load responsive sensing means, comprising:

an elongated follower lever having first and second end portions and a mid-portion with an aperture therethrough;

means for pivotally mounting both the one end portion of the spring and the mid-portion of the lever in coaxial relation to one another;

spring contact means supported by the first end portion of the lever follower with a contact surface thereof engaging one face of the spring's end portion;

a deformable elastomeric bumper supported by the first end portion of the follower lever and contacting the opposite face of the spring's end portion;

the spring contact means and the deformable elastomeric bumper being spaced with respect to one another and contacting the two faces of the spring end portion respectively so that the contact surface is firmly held against the face of the spring's end portion even as the spring end pivots about the mounting means;

the pivotal mounting means for the mid-portion of the follower lever including a generally tubular sleeve member adapted to be securely mounted within the aperture of the follower lever;

a low-friction bearing means having outer and inner housing portions rotatable with respect to one another and supporting rollable elements therebetween;

the outer housing portion being secured to the tubular sleeve and the inner housing portion being supported by the spring end fastening means so that the housing portions are coaxial with the support of the spring end portion whereby relatively rapid pivotal movements of the spring end portion caused by road bumps are nearly effortlessly transmitted to the follower lever through the spring contact means and elastomeric bumper;

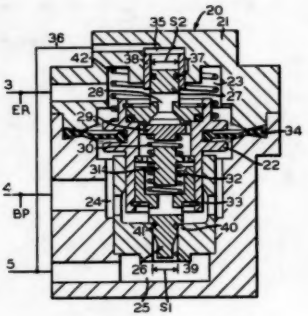
an elongated and yieldable connecting means between the second end portion of the lever and the input of the proportioning valve to generate and transmit a force input to the proportioning valve input in response to angular movements of the spring's end portion and the lever.

4,678,241

EQUALIZER DISCHARGE VALVE FOR A RAILROAD CAR AIR BRAKE SYSTEM

Hideo Tamamori, Kobe, and Mitsuhiro Ikeda, Amagasaki, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Mar. 10, 1986, Ser. No. 838,214
Claims priority, application Japan, Mar. 11, 1985, 60-49062; Mar. 11, 1985, 60-49063
Int. Cl.[4] B60T *11/34*
U.S. Cl. 303—33 **9 Claims**



1. An equalizer discharge valve for use on a railroad air brake system having an equalizer reservoir, a brake valve, and a brake pipe extending through each railroad car of the train, said equalizer discharge valve comprising:

(a) a valve housing;

(b) a piston movable within a chamber formed in said valve housing;

(c) a diaphragm connected to said piston on the inner circumference and connected to said valve housing on the outer circumference;

(d) said piston and said diaphragm dividing said chamber into an equalizer chamber on one side of said piston and a brake pipe chamber on the opposite side of said piston;

(e) a connecting passageway formed through said piston;

(f) a check valve partially formed on a portion of said piston adjacent said connecting passageway, said check valve being effective such that fluid pressure can flow only from said equalizer chamber to said brake pipe chamber when said check valve is open;

(g) an exhaust chamber disposed in said valve housing below said brake pipe chamber; and

(h) an exhaust valve formed between said brake pipe chamber and said exhaust chamber, said exhaust valve being effective such that, upon a preselected reduction in fluid pressure in said equalizer chamber, said piston rises and opens said exhaust valve to exhaust an amount of fluid pressure from said brake pipe chamber substantially equivalent to such preselected reduction of fluid pressure from said equalizer chamber.

4,678,242

HYDRAULIC VEHICLE BRAKE SYSTEM WITH ANTI-LOCKING

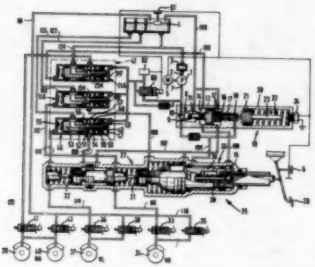
Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,675

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437575

Int. Cl.[4] B60T *13/68*

U.S. Cl. 303—92 **5 Claims**



1. A hydraulic vehicle brake system with anti-locking, wherein a braking pressure generator (**25**) comprising a hydraulic power booster (**26**) and a master cylinder (**27**) connected downstream thereof is employed for the pressure supply of the brake circuits, wherein wheel brakes (**34, 37**) are connected to the pressurizable working chambers (**31, 32**) of the braking pressure generator by way of first valves (**33, 36**), and wherein the respective working chambers (**31, 32**) are connectible with an auxiliary pressure source (**1**) by way of second valves (**147, 47**), a third valve (**60**) being interposed, between the auxiliary pressure source and the second valves, which can be switched to assume an open position in response to a pedal contact and a predetermined minimum pressure of the auxiliary pressure source, wherein the second valves (**147, 47**) are provided as double seat valves of the same kind, and include a piston (**153, 53**) which is displaceable by the pressure in the respective brake circuit and by which a hydraulic connection is provided in the brake pedal's release position between the respective working chamber (**31, 32**) and an unpressurized supply reservoir (**4**).

4,678,243

METHOD AND APPARATUS FOR CONTROLLING BRAKE PRESSURE IN VEHICLE BRAKE SYSTEMS

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

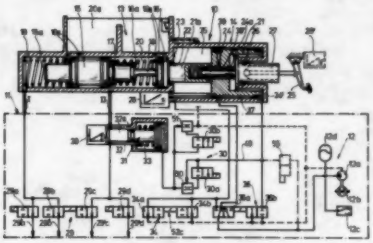
Filed Nov. 21, 1985, Ser. No. 800,570

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444827

Int. Cl.[4] B60T *8/02*

U.S. Cl. 303—114 **28 Claims**

13. An apparatus for controlling and adapting brake pressure in a vehicle brake system, comprising a hydraulic brake booster provided with an associated pedal-actuated brake valve for feeding a pressure medium from a pressure medium supply means to at least one wheel brake cylinder in at least one closed brake circuit between said brake booster and said at least one wheel brake cylinder, at least one supplementary pump piston being provided in said at least one closed brake circuit between said brake booster and said at least one wheel brake cylinder, said supplementary pump piston being provided with pressure supply and pressure withdrawal lines for regulating its supply of brake pressure and said supplementary pump piston has a pressure supply line for pressurizing said pressure chamber to a booster chamber of the hydraulic brake booster and said supplementary pump piston further has a return line connected via a second magnetic valve to the pressure medium supply means for depressurizing said pressure



chamber, and said pressure supply and return lines include throttle means therein.

4,678,244

CORE OF RUBBER CRAWLER

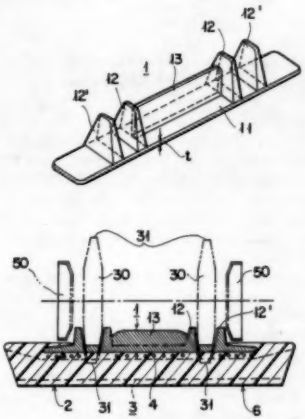
Mitsuo Furuta, Hiratsuka, and Shinji Uchida, Kanawaga, both of Japan, assignors to Bridgestone Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,767

Claims priority, application Japan, Jul. 5, 1984, 59-139315

Int. Cl.[4] B62D *55/18*

U.S. Cl. 305—57 **1 Claim**



1. A rubber crawler core, comprising:

a rectangular core body having longitudinal ends;

at least one pair of protrusions integrally formed with the core body, said protrusions being situated adjacent to the longitudinal ends of the core body and extending upwardly therefrom;

at least one rib integrally formed with the core body, said rib extending upwardly from the core body between the protrusions in an orientation perpendicular to the protrusions, each rib having a height exceeding a middle or center portion of the protrusion; and

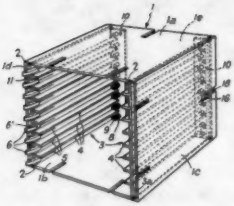
an additional protrusion formed adjacent each respective protrusion of said pair of protrusions, each additional protrusion being spaced from the respective adjacent protrusion of said pair of protrusions outwardly toward the longitudinal end of the core body to permit a drive tumbler to pass between the protrusion and the additional protrusion.

4,678,245

MODULAR DEVICE FOR STORING COMPACT DISCS OR THE LIKE

Jean-Pierre Fouassier, 10, rue de Strasbourg, 94230 Cachan, France

Continuation-in-part of Ser. No. 740,048, May 22, 1985, abandoned. This application Apr. 11, 1986, Ser. No. 850,615
Int. Cl.[4] A47B *81/06*
U.S. Cl. 312—15 **8 Claims**



1. A modular device for storing a plurality of objects such as compact disc cartridges, audio tape cassettes, video tape cassettes or the like comprising:

(a) a frame comprising:

(i) a generally horizontal bottom wall;

(ii) two generally vertical outer side walls and a generally vertical rear wall extending upwardly from the bottom wall; and,

(iii) a generally horizontal top wall attached to the outer side and rear walls to define a frame having an open front;

(b) first and second inner side walls each having a plurality of generally horizontal fixed protrusions extending from one side thereof, each inner side wall having an edge portion and defining a slot having an end;

(c) guide means defined by the bottom and top walls for removably locating an inner side wall adjacent to an outer side wall such that the inner side walls extend generally parallel to the adjacent outer side wall;

(d) releasable locking means interposed between an inner side wall and an adjacent outer side wall to positively latch the inner side wall to the adjacent outer side wall;

(e) a resilient tongue formed on at least one of the inner side walls so as to be located near the open front of the frame, the tongue having a distal end;

(f) a retaining hook member formed on the distal end of the resilient tongue; and,

(g) at least one removable protrusion removably attached to each inner side wall, the removable protrusion comprising:

(i) a generally planar, horizontally extending portion;

(ii) a fixing portion attached to the planar portion;

(iii) a first catch means defined by the fixing portion and the planar portion adapted to removably engage the edge portion of the inner side wall; and

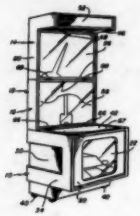
(iv) a second catch means defined by the fixing portion and the planar portion adapted to removably engage the end of the slot defined by the inner wall.

4,678,246

DISPLAY DEVICE

Willy Ytter, Stockholm, Sweden, assignor to Extraversion, Inc., New York, N.Y.

Continuation of Ser. No. 397,514, Jul. 12, 1982, Pat. No. 4,601,524. This application May 3, 1985, Ser. No. 730,083
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] A47F *3/00*
U.S. Cl. 312—114 **20 Claims**



1. A display apparatus comprising;

a base housing having a front wall including a first display means,

an upper housing overlying the base housing and including a second display means,

means hingedly securing the upper housing to a rear end of a top surface of the base housing along a base hinge line,

said upper housing having a display position in which said second display means is directed forwardly and in which the upper housing is in an upright position, and a storage position in which at least part of the upper housing is disposed to extend over the top surface of the base housing,

said upper housing having top and bottom housing sections wherein the top section is disposed over the bottom section in the display position, and in the storage position the bottom section is disposed over the top surface of the base housing while the top section extends to cover the first display means,

means for hingedly securing the upper housing top housing section to the upper housing bottom housing section,

said bottom and at least part of said top housing sections, in said display position, adapted to be disposed in substantially co-planar vertical position,

said the top section of the upper housing being hinged from the bottom sections with the hinge line disposed, in the storage position, adjacent the edge formed between the top surface and front surface of the base housing.

4,678,247

REFRIGERATOR SHELF FOR DISPENSING CANS OR THAWING FOOD

John J. Pink, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Dec. 20, 1985, Ser. No. 811,224
Int. Cl.[4] A47F *3/04*
U.S. Cl. 312—116 **10 Claims**

1. Food thawing and can dispensing apparatus for a refrigerator, comprising:

a tray having a bottom and raised sides;

means for supporting said tray in a refrigerator; and

said tray comprising a downwardly extending lateral leg at one end thereof, said leg being seatable on said supporting means in a first position of said tray with respect to said supporting means for holding said bottom horizontally, said leg further being seatable on said supporting means in a second position of said tray with respect to said supporting means for holding said bottom at an incline wherein, in said second position, said tray is adapted for storing cans rollably disposed towards the front of said refrigerator.

4,678,248

DIRECT SELF-CONTROL OF THE FLUX AND ROTARY MOMENT OF A ROTARY-FIELD MACHINE

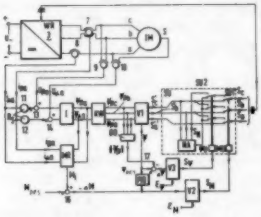
Manfred Depenbrock, Bochum-Stiepel, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Oct. 18, 1985, Ser. No. 788,816

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, 3438504

Int. Cl.[4] H02P *7/36*

U.S. Cl. 318—805 **15 Claims**



1. Apparatus for controlling a rotating-field machine, comprising: an inverter having an output voltage system being connected to the rotating-field machine and being variable with respect to amplitude, phase and frequency; an integrator connected to said inverter and a component converter connected to said integrator for forming amplitudes of stator flux components from measured stator current components and stator voltage components as actual values of a flux control loop; means for supplying a predetermined stator flux reference value; and a flux control in the form of a comparator having inputs connected to said component converter for receiving the amplitudes of the flux components and to said supplying means for receiving said stator flux reference value, and said flux control having an output connected to said inverter for delivering switching state variables for driving said inverter, said flux control changing the phase and frequency of the inverter output voltage system as a function of said stator flux reference value.

4,678,249

ELECTRICAL SWITCH HAVING FLEXIBLE PRINTED CIRCUIT CONNECTOR CABLE

Charles E. Black, III, Mount Prospect, and Raymond T. Halstead, Wheeling, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Dec. 27, 1985, Ser. No. 813,771

Int. Cl.[4] H01R *4/48*

U.S. Cl. 439—77 **3 Claims**

1. An electrical switch or the like, comprising

an electrically insulating terminal supporting member having first and second opposite sides,

said member having a substantial rigidity and being made of a resinous plastic material,

said member having an opening therein extending between said opposite sides,

an electrically conductive terminal rivet having a head portion on said first side of said terminal supporting member,

said rivet having a shank portion connected to said head portion and extending through said opening in said member,

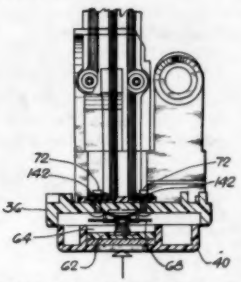
a flexible laminated printed circuit having an aperture therein for receiving said shank portion of said rivet,

said flexible printed circuit having an electrically insulating base lamina and an electrical conductor lamina securely laminated to said base lamina,

said base lamina being made of a thin flexible resilient electrically insulating resinous plastic material,

said electrical conductor lamina being made of thin flexible metal,

said base lamina engaging said second side of said insulating terminal supporting member,



and a compressible annular spring washer mounted on said shank portion of said rivet and engaging said electrical conductor lamina,

said rivet having an upset end portion on said shank portion for securely engaging and retaining while also compressing said compressible spring washer,

said washer being made of thin flexible resilient metal and being formed with a central annular dished portion,

a reversely dished peripheral annular portion,

and a smoothly rounded annular bulging portion therebetween for engaging said conductor lamina without any tendancy to cut into said conductor lamina,

said washer being resiliently compressible to obviate any looseness of said terminal rivet despite any minor dimensional variations and despite any shrinkage of said flexible printed circuit and said terminal supporting member due to such factors as aging and temperature variations.

4,678,250

MULTI-PIN ELECTRICAL HEADER

Edward L. Romine, Hoffman Estates, and Roger W. Byczek, Westchester, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

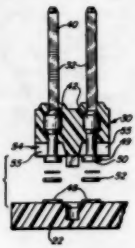
Filed Jan. 8, 1985, Ser. No. 689,668

Int. Cl.[4] H05K *1/00*

U.S. Cl. 439—83 **9 Claims**

1. A multiple male pin electrical header for connection to the surface of a printed circuit board, the header comprising, in combination, an integral, electrically insulating body member, and a plurality of solid, generally cylindrical male pin connectors extending at least partly through the body member, at least one pin having a tail portion adapted to electrically contact the surface of a printed circuit board and being provided with a pad tip recess opening in the direction of the axis of the cylindrical male pin and adapted to temporarily receive in a recess a reflow solder pellet oriented parallel to the surface of the underlying printed circuit board, the pin further having a head portion adapted for connection with another electrical connector, the insulating header body portion being formed to define a plurality of pin cavities, each cavity being shaped to expose

a single individual solid male pin connector side for contact by a test probe, yet discourage simultaneous test probe shorting



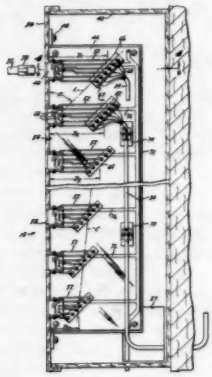
contact with a plurality of connector pins or a plurality of single connector pin surfaces.

4,678,251

MODULAR INSTALLATION SYSTEM FOR DATA CABLE INTERFACING

Stephen J. Willard, Granada Hills, Calif., assignor to Installation Technology, Inc., Birmingham, Mich.

Filed Feb. 10, 1986, Ser. No. 827,945
Int. Cl.[4] H01R *29/00*
U.S. Cl. 439—61 **17 Claims**



1. An installation system for interfacing a plurality of entrance cables comprising:

a circuit board having a first plurality of traces and a second plurality of traces and having a first edge;

a first jack secured to said circuit board adjacent said first edge and electrically coupled to said first plurality of traces;

a second jack secured to said circuit board adjacent said first edge and electrically coupled to said second plurality of traces;

first connector means secured to said circuit board and electrically coupled to said first plurality of traces for coupling a first one of said entrance cables thereto;

second connector means secured to said circuit board and electrically coupled to said second plurality of traces for coupling to a second one of said entrance cables;

a panel having first and second apertures for registration respectively with said first and second jacks;

a bracket for securing said circuit board to said panel with said first edge most adjacent said panel;

said bracket having a shield plate means extending in spaced relation to said first and second plurality of traces; and

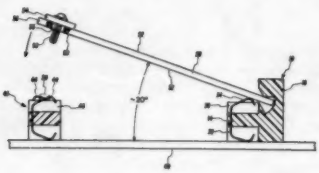
jumper cable means having plug connectors at the ends thereof for removably engaging said jacks and for establishing electrical communication between said first and second connectors.

4,678,252

ELECTRICAL CONNECTOR FOR CIRCUIT BOARDS

Larry V. Moore, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 27, 1986, Ser. No. 866,650
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—62 **10 Claims**



1. Electrical connector apparatus for use with a printed circuit board of a given width and a predetermined thickness and having electrical contacts on one surface near an edge to be inserted into the electrical connector apparatus comprising, in combination:

(a) angled insulator means having first and second legs and a predetermined length at right angles to the legs;

(b) a pie-shaped cavity in said insulator means at the meeting point of said two legs with the cavity extending for a distance necessary to receive the printed circuit board, the pie-shaped cavity being such that the edge of a printed circuit board inserted into said cavity can be moved through an arc of at least 15 degrees terminating with a position parallel to said first leg;

(c) flexible electrical contact means forming a portion of said first leg and extending above the surface thereof, the dimensions of said cavity and the electrical contact means being such that a printed circuit board being inserted into said cavity must be inserted at an angle of approximately at least 15 degrees with respect to said first leg and then moved through an arc to be parallel with said first leg whereby good electrical contact is made between electrical contacts on the one surface of the printed and said flexible electrical contact means of said electrical connector apparatus.

4,678,253

BUS DUCT HAVING IMPROVED BUS BAR CLAMPING STRUCTURE

Loy A. Hicks, Jr., Nazareth; Edward P. Sherwood, Allentown, and Thomas J. Saks, Bethlehem, all of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 665,480, Oct. 29, 1984. This application Apr. 22, 1985, Ser. No. 724,954
Int. Cl.[4] H02G *5/08*
U.S. Cl. 439—210 **37 Claims**

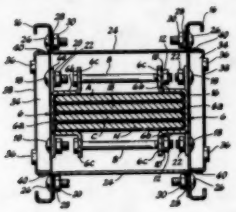
1. A bus duct comprising, in combination:

a plurality of wide flat bus bars arranged in stacked relation with flat surfaces of each bus bar in face-to-face engagement with contiguous flat surfaces of adjacent bus bars;

U-shaped reinforcement members disposed over opposite edges of said stacked bus bars with bight portions of said members abutting respective edges of said stacked bus bars and legs of each member extending along outermost flat surfaces of said stacked bus bars toward corresponding legs of a respective opposed member, free ends of said legs being disposed outwardly from said outer flat surfaces; and

clamping means engaging said outwardly disposed free ends

of opposed ones of said reinforcement members for urging said members together against said edges of said stacked bus bars and for applying a bending moment to said legs



about respective junctures thereof with said bight portions for urging said legs inwardly against said flat surfaces of said stacked bus bars for compressing said bus bars together in face-to-face relation.

4,678,254

HIGH INTENSITY POWER PLUG

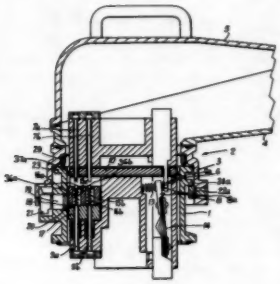
Yves Le Magourou, Ermont, France, assignor to Societe d'Exploitation des Procedes Marechal (SEPM), Paris, France

Filed Dec. 20, 1985, Ser. No. 811,475

Claims priority, application European Pat. Off., Dec. 27, 1984, 84 402722.7

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—139 **46 Claims**



1. An electric power connection comprising:
(a) a socket comprising first power contacts:
(b) a plug comprising second power contacts adapted to be connected to said first power contacts;
(c) a pilot circuit comprising first pilot contacts provided in said socket and second pilot contacts provided in said plug, said pilot circuit controlling the de-energization and energization of said first power contacts when said circuit is opened and closed, respectively; and
(d) manipulation means for preventing certain movements of said plug and said socket when said pilot circuit is in a closed position and for allowing said certain movements when said pilot circuit is in an open position.

4,678,255

CHIP CONNECTOR

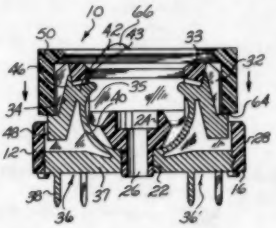
Clyde T. Carter, Shermans Dale, Pa., assignor to Wells Electronics, Inc., South Bend, Ind.

Filed Apr. 3, 1986, Ser. No. 847,932

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—267 **4 Claims**

1. A connector for a chip carrier, said connector including a base member having a central opeing therein, a plurality of conductive contacts for engaging said carrier, each contact anchored in said base member and including an upwardly extending part, said contacts positioned on at least one side edge of said base member opening and constituting clamp means for engaging said carrier within said, connector, the improvement wherein each contact includes an upward projection extending from its upwardly extending part, and a cantilevered part projecting outwardly from the upwardly extending part outwardly of said base member opening, said



base member including integral positioning means contacting each contact upward projection for biasing said contacts in a clamping position within said base member opening, and a movable top overlying said base member, said top including an abutment means in contact with each said contact cantilevered part for moving and flexing said contacts into an unclamped position outwardly of said base member opening upon movement of the top in a substantially straight line downward direction.

4,678,256

CONNECTOR

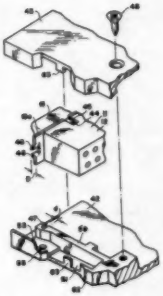
Yoshimitsu Nishino; Wataru Tsuruda; Kihachiro Koike, and Kensaku Matsuoka, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry Limited; NEC Corporation and Hirose Denki Kabushiki Kaisha, all of Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 804,424

Claims priority, application Japan, Dec. 10, 1984, 59-186923[U]; Dec. 10, 1984, 59-186924[U]

Int. Cl.[4] H01R *13/629*

U.S. Cl. 439—347 **13 Claims**



1. A connector comprising:
a plug connector having a plurality of plug contact pins projecting out forwardly of a body of an insulating material and a metallic shell mounted on the front of the body in a manner to surround projecting portions of the contact pins arranged in a predetermined pattern;
a cover in which the plug connector is entirely housed with the front end face of its shell positioned near a front opening of the cover, recesses being made in both side walls of the cover and first slots being made in the cover to extend from the recesses to the front opening of the cover; and
locking members respectively housed in the recesses of the

cover, each locking member being made of a strip of resilient metal and having at its intermediate portion a shaft through which it is pivotally mounted on the cover, a portion of each locking member extending forwardly of the shaft being bent inwardly to form a locking portion which extends forwardly through the first slot in the cover, a gap being defined between the locking member and either side face of the shell of the cover for receiving a locking piece of a receptacle connector, a portion of each locking member extending rearwardly of the shaft having a release lever which projects out of the recess of the cover, the rear end portion of the release lever being bent and the bent end portion being urged against a partition wall made in the cover.

4,678,257

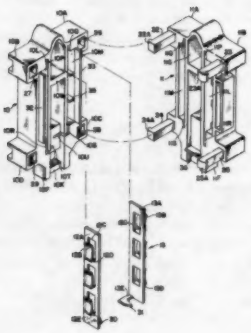
MULTIPLE-SOCKET END CONNECTOR FOR EXTENSION CORDS

Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199

Continuation-in-part of Ser. No. 755,230, Jul. 17, 1985. This application May 27, 1986, Ser. No. 865,795

Int. Cl.[4] H01R *19/28*

U.S. Cl. 439—426 **15 Claims**



1. A housing for a multiple-socket end connector, comprising:

two interfitting housing shells each having a set of openings extending through the exterior surface of the shell, each set being adapted to receive two blades of an electrical plug, said shells having spaced elongated pockets arranged to provide two internal elongated cavities communicating with said sets and adapted to receive two parallel conductor members for engagement by the blades of plugs occupying said sets, and said shells having central elongated recesses arranged to jointly provide an externally opening wireway extending between said elongated cavities for receiving an electrical cord;

two pairs of flexible legs projecting integrally from one of said shells near opposite ends thereof, each leg having a laterally extending locking foot at its free end, said legs being arranged to extend through open-ended bores formed in the other shell and having their locking feet engaging retaining shoulders at the outer ends of the bores to prevent withdrawal of the legs from the bores;

each of said bores having a widened mouth portion at its inner end aligned with the respective retaining shoulder for introduction of the locking foot of the respective leg at the start of assembly of the housing, and then tapering inwardly from said mouth portion such as to spring the leg inwardly during assembly until its locking foot reaches the outer end of the bore and springs back outwardly to fit over the respective retaining shoulder.

4,678,258

CONNECTORS FOR THE CONNECTION OF LIGHTS ON MOTOR VEHICLES

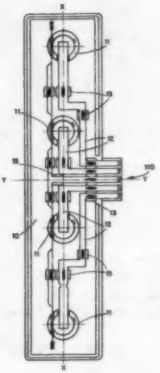
Giuliano Cossetti, Tolmezzo, Italy, assignor to Seima Italiana S.p.A., Tolmezzo, Italy

Continuation of Ser. No. 505,441, Jun. 17, 1983, abandoned. This application Feb. 14, 1985, Ser. No. 701,455

Claims priority, application Italy, Aug. 27, 1982, 83437 A/82

Int. Cl.[4] B60Q *1/26;* **H01R** *13/60*

U.S. Cl. 439—571 **5 Claims**



1. A panel for lights on motor vehicles, which comprises applied conductor-element strips and an insulating support, said support defining at least two walls for each conductor-element strip permitting a conductor-element strip to slide reciprocally, such walls cooperating with the conductor-element strip by interference, said two walls being opposite each other, between which fits the conductor-element strip, said support defining a central wall between said two walls, said conductor-element strip having a slot therein which fits over said central wall and which is longer than the central wall, said central wall having an undercut, the placement of the conductor-element strip over the central wall taking place by elastic deformation of the central wall.

4,678,259

METAL JUNCTION BOX FOR PLUG-IN MULTICONTACT CONNECTOR

André Petit, Longpont sur Orge, France, assignor to Alcatel, Paris, France

Filed Jan. 21, 1986, Ser. No. 820,291

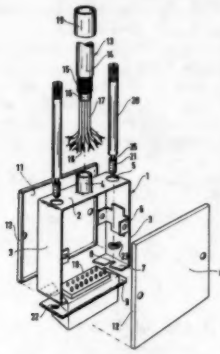
Claims priority, application France, Jan. 23, 1985, 85 00928

Int. Cl.[4] H01R *13/648*

U.S. Cl. 439—610 **2 Claims**

1. In a metal box for connection of a cable (13) having a grounding shield (15) surrounding insulated electrical conductors (17) which extend out from the end of the said shield, the ends (48) of the conductors (17) being connected to a multi-pin connector plug (10), said box being equipped with a sleeve (4) over which the grounding shield (15) is fitted, the said end being held in place around the sleeve by a ferrule (19), the improvement wherein the said box includes a bracket (1) consisting of a central arm (2) and two, right angle, parallel side arms (3), two lateral covers (11) terminating in flanges (12) orthogonal to the planes of the said covers (11), said sleeve (4) is fixed to the central arm (2) of the bracket (1) and directed along the axis of the bracket, and wherein said bracket (1) includes on its two side arms (3) double mounting lugs (6), respectively, said two covers (11) being screwed to said double mounting lugs from opposite sides of the box, said side arms terminating at ends remote from said central arm and in respec-

tive tabs (7) directed toward the inside against said connector plug (10) said plug including a metal plate (9) pressed against said tabs, the said plate (9) having ends abutting said tabs (7) and wherein said flanges (12) of said covers (11), overlie respective edges of the bracket (1) and aligned edges of the said



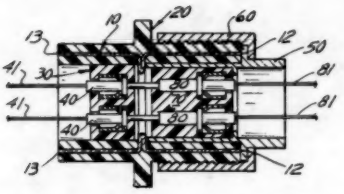
metal plate such that the box physically protects the conductors (17), holds the cable (13) in place and provides shielding due to the good electrical contact between the grounding shield 15 and the box and the flanges 12 surrounding the edges of the bracket (1) and the metal plate (9) of the connector plug (10).

4,678,260

EMI SHIELDED ELECTRICAL CONNECTOR

David O. Gallusser, Oneonta; Robert W. Brush, Sr., Unadilla, and David W. MacAvoy, Bainbridge, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 14, 1984, Ser. No. 610,069
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—607 **9 Claims**



7. In combination with an EMI shielded connector assembly of the type having a tubular plastic outer housing; a dielectric insert having a plurality of axial passages therein, said insert mounted in said plastic outer housing; and a plurality of electrically conductive contacts mounted in respective passages in said dielectric insert, the improvement wherein said plastic outer housing is characterized by:

an electrically conductive foraminous sleeve embedded in the plastic outer housing, the inside surface and outside surface of said sleeve completely covered by the material of said plastic housing, said foraminous sleeve being comprised of an electrically conductive wire mesh having a plurality of holes substantially evenly distributed throughout said sleeve, and with said plastic housing molded in a manner such that substantially all of said holes are filled with plastic material of said housing whereby the mechanical strength of the connector housing is strengthened; and

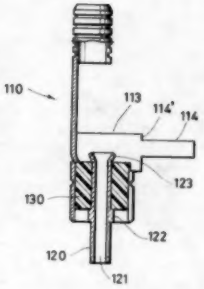
an electrically conductive annular shoulder extending radially inward from said tubular plastic housing, said conductive annular shoulder electrically connected to said electrically conductive foraminous sleeve and being an integral part thereof, and the ends of said sleeve and said inwardly extending shoulder being exposed for electrical connection in direct contact with another electrically conductive member extending within the interior of said plastic housing.

4,678,261

L-TYPE COAXIAL PLUG CONNECTOR

Ikujirou Mitani; Norihide Kawanami, and Fumio Kobayashi, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1986, Ser. No. 855,183
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—582 **5 Claims**



1. An L-type coaxial plug connector comprising:

a central terminal adapted to be connected to the core conductor of a coaxial cable so as to constitute a part of the core conductor of the coaxial line to be formed;

an outer shell adapted to be connected to the outer conductor of said coaxial cable so as to constitute a part of the outer conductor of the coaxial line to be formed;

and

a crimp sleeve on an outer sheath of said coaxial cable and adapted to be collapsed so as to fix said coaxial cable to said plug connector;

wherein said outer shell has a cylindrical portion holding a dielectric member in which said central terminal is fixed, a cylindrical outer conductor fitting portion adapted to be inserted into the boundary between the inner dielectric layer and the outer conductor of said coaxial cable, and an intermediate portion which extends axially from a portion of an upper circumferential edge of said cylindrical portion so as to connect said portion of said cylindrical portion to the corresponding portion of the lower circumferential edge of said outer conductor fitting portion such that the axes of said cylindrical portion and said outer conductor fitting portion extend in parallel with each other,

said intermediate portion having a U-shaped arm portion which extends from said intermediate portion in the direction perpendicular to said axis of said cylindrical portion, and a cover portion which is adapted to cover an adjacent open end of said cylindrical portion when said intermediate portion is flexed substantially orthogonally towards said U-shaped arm portion.

4,678,262

CONTACT ELEMENT

Manfred Reichardt, Weinsberg, and Rolf D. Loss, Heilbronn, both of Fed. Rep. of Germany, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 730,216, May 3, 1985, abandoned. This application Oct. 14, 1986, Ser. No. 918,191

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416968

Int. Cl.[4] H01R *13/41, 13/11*

U.S. Cl. 439—857 7 Claims

1. A single piece contact element comprising a termination portion at one end, a female contact portion at the other end, a press fit region between said termination portion and said female contact portion, said press fit region being adapted to form a contacting region when said contact element is pressed into a contact opening of a circuit board, an opening in said contact element in an area above the press fit region, a receiving surface formed at said opening, and a connecting portion arranged between the press fit region and the female contact portion, the connecting portion being bent such that the longitudinal axis of the female contact portion is aligned with the longitudinal axis of the termination portion, said opening being formed in said bent connecting portion, said receiving surface being aligned with the longitudinal axis of the termination portion of the contact and said receiving surface being adapted to receive a press-in tool pin introduced through said female contact portion and said opening along the longitudinal axis of said female contact portion, to allow said contact element to be press-fitted into a contact opening of a circuit board.

4,678,263

PHOTO SCANNER DEVICE

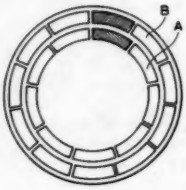
Hiroyoshi Funato, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 565,817, Dec. 27, 1983, abandoned. This application Oct. 21, 1985, Ser. No. 788,528

Claims priority, application Japan, Dec. 24, 1982, 57-225815

Int. Cl.[4] G02B *26/10, 26/08*

U.S. Cl. 350—3.71 2 Claims



1. A photo scanner device comprising:

a rotary disk having a plurality of holograms thereon and arranged in at least two concentric circles with respect to the axis of rotation of said disk;

a light source which generates a beam of light which is incident on the disk at a selected radial distance which may be varied so as to illuminate the holograms arranged on a selected concentric circle;

the holograms on the same concentric circle each subtending the same angle from said axis;

the holograms on different concentric circles subtending different angles from said axis, thereby permitting the angle of scan to be switched by selection of the radial distance at which said beam of light is incident;

the holograms at the same radial distance from the axis of rotation each having substantially the same grid direction; and

the holograms at different radial directions having different grid directions so that a scanning start point is the same irrespective of the difference in scanning angle caused by the holograms at different radial distances subtending different angles from the axis.

4,678,264

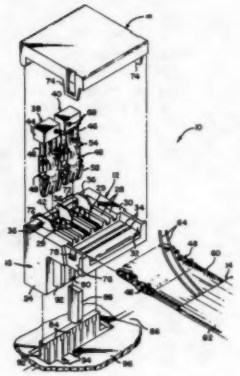
ELECTRICAL AND FIBER OPTIC CONNECTOR ASSEMBLY

Terry P. Bowen, Etters; Douglas W. Glover, Harrisburg; Charles D. Hoover, Harrisburg; John H. Huber, Harrisburg, and Ronald R. Schaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 480,569, Mar. 30, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,275

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 17 Claims



1. An electrical and fiber optic connector assembly for terminating a cable having electrical conductors and fiber optic transmission members, for electrical connection of the electrical conductors to conductive members of an electrical article and optical connection of the fiber optic transmission members to photoelectric devices and then electrically connecting the photoelectric devices with other conductive members of the electrical article, comprising:

a dielectric housing having a termination section including a cable-receiving channel and including conductor-receiving passageways and fiber-receiving passageways extending forwardly from said channel, device-receiving cavities at forward ends of said fiber-receiving passageways, and terminal-receiving passageways extending inwardly from a mating face and in communication with said conductor-receiving passageways and said device-receiving cavities, said conductor-receiving passageways adapted to receive said conductors having first terminals terminated thereon

and said fiber-receiving passageways adapted to receive and selectively locate end portions of said fiber optic transmission members;

photoelectric devices associated with respective said fiber optic transmission members and having fiber-connecting means for optical connection with said fiber optic transmission members, said photoelectric devices having electrical leads extending therefrom with second terminals terminated thereon, said photoelectric devices being located in said device-receiving cavities such that said fiber-connecting means are located at forward ends of said fiber-receiving passageways and said second terminals on said electrical leads are located in respective said terminal-receiving passageways proximate said mating face; and

a cover member securable to said housing at said termination section after said cable is received therealong and is adapted to secure and strain relieve said cable in said housing and to secure said conductors and said fiber optic transmission members in respective said conductor-receiving and fiber-receiving passageways and to secure said photoelectric devices in said housing, whereby

said end portions are receivable along said fiber-receiving passageways and are optically connectable to said photoelectric devices at and by said fiber-connecting means thereof, and said terminated conductors are receivable along said conductor-receiving passageways such that said first terminals are located in respective said terminal-receiving passageways proximate said mating face, after which said cover member secures said cable to said housing and said conductors and said fiber optic transmission members therewithin for connection to respective conductive members of an electrical article at said mating face.

4,678,265
OPTICAL FIBER PLUG DEVICE INCLUDING FIBER FOR MONITORING A LIGHT SOURCE

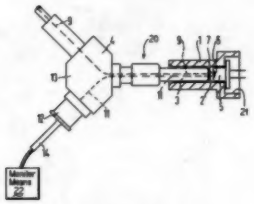
Ludwig Fink, Pullach, and Hans-Norbert Toussaint, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,265

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 8317054[U]

Int. Cl.[4] G02B *6/36;* **H01J** *5/16*

U.S. Cl. 350—96.20 **6 Claims**



1. In a light waveguide plug device having two halves, one of said two halves being a body with a pin-like section, said section having an end face and a concentric bore receiving an optical fiber as a light waveguide with an end of the waveguide being plane-parallel to the end face of said section of said body and the other half of said two halves having a guide sleeve and a light exit surface of a light transmitter, the plane-parallel end of the waveguide being adjustable relative to the other half by said section being adjustably received in the guide sleeve so that said plane-parallel end of the waveguide receives light from the light exit surface and is adjustably positioned relative to the light exit surface by moving the section in the guide sleeve, the improvements comprising the pin-like section having an additional bore extending along the length of the pin-like section and being both offset and spatially separated from the concentric bore, said additional bore having an end being offset from and situated as closed as possible to an end of the concentric bore at the end face of the pin-like section, and an additional elongated light waveguide having an end surface being disposed in said additional bore with the end surface at the end face of the pin-like section so that with the pin-like section in a desired position relative to the light exit surface, light of the light exit surface is also beamed into the end surface of the additional elongated waveguide.

4,678,266
USE OF PNICTIDE FILMS FOR WAVE-GUIDING IN OPTO-ELECTRONIC DEVICES

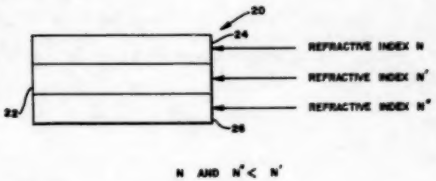
Diego J. Olego, Croton-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 509,210, Jun. 29, 1983, Pat. No. 4,567,503, which is a continuation-in-part of Ser. No. 581,115, Feb. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 581,140, Feb. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 581,171, Feb. 17, 1984, abandoned. This application Jan. 28, 1985, Ser. No. 695,255

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.12 **25 Claims**



1. An electro-optical device comprising:

(A) a semiconductor body; and

(B) at least one pnictide layer for guiding light waves in said body wherein said pnictide layer comprises a material chosen from the group consisting of MP_x and elemental pnictide in non-compound form, where M is an alkali metal, P is a pnictide, and x ranges from 15 to infinity.

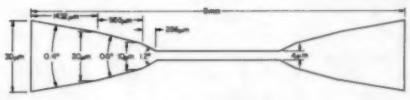
4,678,267
PARABOLIC OPTICAL WAVEGUIDE HORNS AND DESIGN THEREOF

William K. Burns, Alexandria, Va., and A. Fenner Milton, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 852,646, Nov. 18, 1977, abandoned. This application Jun. 30, 1981, Ser. No. 279,105

Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—96.15 **2 Claims**



1. Means for coupling between a narrow and a wide-channel optical waveguide for bidirectionally propagating rays of single-mode optical power and preserving the power in the first-order mode comprising:

a coupling section of optical dielectric waveguide having a constant refractive index, and having a shape varying in width from a narrow opening, for fitting the width of the

narrow-channel optical waveguide, to a wider opening for fitting the width of the wide-channel optical waveguide, so that said coupling section forms a continuous waveguide from said narrow-channel waveguide to said wide-channel waveguide,

said shape being defined from the equation

$$\theta_h = \alpha\theta_p = \frac{\alpha\lambda_o}{2n_bW} \quad \frac{\mathrm{TAN}^{-1}[b'/(1-b')]^{\frac{1}{2}}}{\pi/2} = \frac{1}{2}\frac{dW}{dz}$$

where θ_h is the local angle formed by the wall of the coupling section and the waveguide axis, θ_p is the projection of the ray angle of the lowest-order mode in the plane of the coupling section, λ_o is the free-space wavelength of the lowest-order normal mode of the narrow-channel waveguide, n_b is the bulk index of refraction of the material which bounds the waveguide, z is the distance coordinate along the axis of the coupling section, W is the width of the coupling section at any specific value of z along the axis of the section, α is a constant less than or equal to unity, and b′ is the normalized mode effective index of refraction, b′ being defined as

$$b' = (n_{eff}'^2 - n_b^2)/(n_{eff}^2 - n_b^2)$$

wherein n'_{eff} is the effective index of refraction of the first-order mode for finite W, and n_{eff} is the effective index of refraction of the first-order mode for $W = \infty$.

4,678,268

METHOD AND APPARATUS FOR CONSTRUCTING MICROLENS ENDS FOR OPTICAL FIBERS

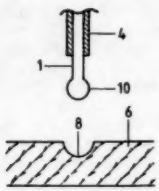
Vera Russo; Stefano Sottini; Giancarlo Righini, and Silvana Trigari, all of Florence, Italy, assignors to Consiglio Nazionale Delle Ricerche Roma, Rome, Italy

Filed Oct. 22, 1984, Ser. No. 663,547

Claims priority, application Italy, Oct. 25, 1983, 9545 A/83

Int. Cl.[4] G02B 6/32

U.S. Cl. 350—96.18 **12 Claims**



1. A method for constructing an integral microlens at an end of an optical fiber made of a material transparent to electromagnetic radiation of at least one frequency, but absorptive of other frequencies, comprising steps of

introducing primary radiation to which said material is transparent into said fiber and along the length thereof toward and through said end,

converting said primary radiation emitted from said fiber end to secondary radiation whose spectrum is at least partially absorbable by a said fiber material, and

causing said secondary radiation to strike said fiber end to heat the same for a time sufficient to cause localized fusion of said end and the rounding thereof by surface tension of the material.

4,678,269

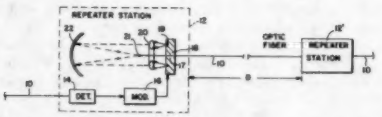
CONCENTRIC LIGHT SOURCE TO FIBER COUPLING SYSTEM

Nevlin C. Pace, P.O. Box 41, Bailey, Miss. 39320

Filed Dec. 10, 1985, Ser. No. 807,329

Int. Cl.[4] G02B 6/42

U.S. Cl. 350—96.18 **3 Claims**



1. A fiber optic light transmission system comprising in combination, a fiber for transmitting light in said system having a fiber joint adapted to receive modulated light thereinto for transmission axially along the fiber, a source of modulated light for transmission through the fiber presenting in a ring shaped light emission pattern concentrically configured about the axis of said fiber and directing the light concentrically toward the fiber joint, said source of modulated light having an edge emitting PN junction diode, an optical system for receiving the concentrically directed light comprising a toroidal collimating lens concentrically located about the fiber in a position near an end of said fiber receiving the concentrically configured light from said source, and a parabolic reflector positioned to inject the modulated light into the end of said fiber in a ring shaped pattern at the end of said fiber.

4,678,270

SUBMERSIBLE OPTICAL REPEATERS AND OPTICAL FIBRE GLANDS

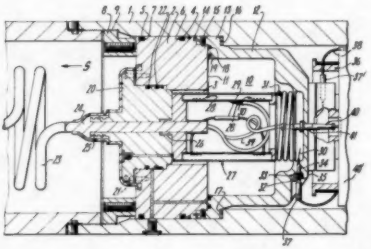
Duncan A. Gunn, Saffron Walden; John C. Crownshaw, Sawbirdgeworth; Arthur A. Davis, Harrold Wood, and Gilbert W. P. Colegate, Orpington, all of England, assignors to Standard Telephones and Cables Public Limited Co., London, England

Filed Jan. 10, 1985, Ser. No. 690,206

Claims priority, application United Kingdom, Jan. 19, 1984, 8401447

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.20 **4 Claims**



1. An optical repeater comprising a tubular casing having a longitudinal axis and a removable bulkhead assembly secured to and closing an end of the casing such as to resist seabed pressures, a regenerator circuit within the casing, said assembly defining a chamber having walls, there being an optical fibre cable sealed through one wall of the chamber, there being an electrical conductor for carrying electrical power from the cable and sealed in an electrically insulating gland through another wall of the chamber, and a coated optical fibre for carrying optical signals between the cable and the regenerator circuit and sealed through a fibre gland separate from the insulating gland and removably secured in an aperture in a wall of the chamber, said fibre gland comprising a tubular gland

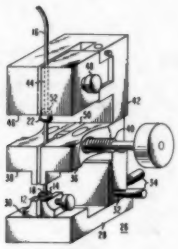
body having an inner bore and a mounting flange, and a rigid primary tube secured to the fibre with adhesive and secured inside the tubular gland body with adhesive, said rigid primary tube fitting closely in the inner bore of the gland body and fitting closely around said coated optical fibre.

4,678,271

APPARATUS FOR ALIGNING A FIBER AND A DEVICE

Andre R. Beaulieu, Pincourt, Canada, assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 26, 1986, Ser. No. 844,137
Int. Cl.[4] G02B 6/42
U.S. Cl. 350—96.20 6 Claims



1. An apparatus for providing and maintaining the alignment between a device and a fiber during the bonding of the fiber to the device and and assembly of a housing thereover, comprising

a base, including means for supporting said device;

a first support connected to said base including means for adjusting the relative position between said base and said first support;

a lower fiber holding means mounted on said first support such that said lower holding means is vertically spaced from, and extends over said device support means;

a second support extending vertically from said lower fiber holding means;

an upper fiber holding means mounted on said second support such that said upper holding means is vertically spaced from, and extends over said lower holding means; and

an alignment element to maintain alignment between said lower and upper fiber holding means; and

releasable means for securing said housing above the lower holding means.

4,678,272

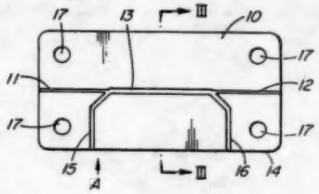
OPTICAL FIBER SPLICE

Roger C. Finn, Nepean, and Morley S. MacKenzie, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 8, 1982, Ser. No. 347,013
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 22 Claims

1. An optical fiber splice joining two optical fibers, each fiber having a plastic coating layer, in an end-to-end relationship, comprising:

two optical fibers fused end-to-end, the coating layer removed from the end of each fiber for a predetermined distance prior to fusion, and



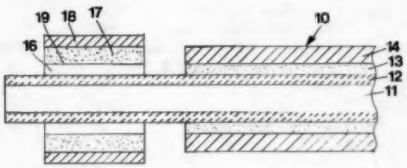
a radiation cured synthetic resin extending in a continuous unbroken layer over the uncoated ends of the fibers and over a predetermined length of the coating of each fiber.

4,678,273

HIGH POWER OPTICAL FIBER WITH IMPROVED COVERING

Kennet Vilhelmsson, Gothenburg, Sweden, assignor to Radians AB, Gotheburg, Sweden

Filed Dec. 24, 1984, Ser. No. 685,783
Claims priority, application Sweden, Dec. 23, 1983, 8307140
Int. Cl.[4] G02B 6/02
U.S. Cl. 350—96.30 8 Claims



1. In an optical fiber for transmitting high optical power having a central core portion adapted to conduct radiation, a cladding layer surrounding the core portion, and at least one covering surrounding the cladding layer and adapted to provide an improved mechanical stability to the fiber and to damp scattered radiation, the improvement for preventing the radiation level in any volume part of the covering from exceeding the limit at which the material of the covering is damaged comprising:

a radiation resistant transmitting material arranged outside of and in contact with the cladding at least at an entrance side over a portion of the length of the fiber and having a real refractive index greater than or close to the refractive index of the cladding; and

at least one additional material layer outside of said radiation resistant transmitting material, at least the outermost layer comprising a heat-conducting means in which the radiation is absorbed.

4,678,274

LOW LOSS CLADDED OPTICAL FIBERS FROM HALIDES AND PROCESS FOR MAKING SAME

Terry A. Fuller, West Bloomfield, Mich., assignor to Fuller Research Corporation, West Bloomfield, Mich.

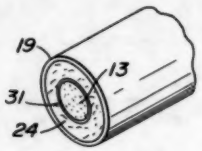
Filed Dec. 27, 1983, Ser. No. 565,569
Int. Cl.[4] G02B 6/16
U.S. Cl. 350—96.34 53 Claims

39. A cladded optical fiber for transmission of electromagnetic energy in the infrared region of the spectrum comprising:

a cylindrical core formed from a first halide compound having a first index of refraction:

a coaxial cladding layer disposed around said core formed from a second halide compound having a second index of refraction less than the first index of refraction;

a first polymer film means coaxially disposed intermediate the cylindrical core and the coaxial cladding layer, said first film means having a radial thickness less than the thickness which causes appreciable energy absorption at infrared frequencies.



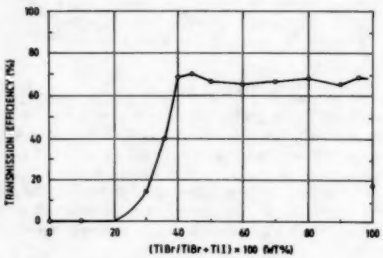
40. A cladded optical fiber according to claim 39 having a second non-hygroscopic polymer film means providing a continuous intimate covering around said cladding layer.

4,678,275

OPTICAL FIBER FOR INFRARED TRANSMISSION CONSISTING ESSENTIALLY OF HIGH PURITY MIXED CRYSTAL OF THALLIUM BROMIDE AND THALLIUM IODIDE

Masaru Ikedo, Ikoma; Masafumi Watari, Osaka; Yoshiaki Hayashi, Osaka; Osamu Yamamoto, Osaka, and Hiroshi Tsutsui, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 26, 1985, Ser. No. 716,156
Claims priority, application Japan, Aug. 2, 1984, 59-163103
Int. Cl.[4] G02B *6/16*
U.S. Cl. 350—96.34 7 Claims



1. An optical fiber which is able to transmit infrared energy of high power and is flexible and long in life, said fiber consisting essentially of a mixed crystal of 40 to 45 wt% of thallium bromide and the balance of thallium iodide, each having a purity not less than 99.9%, said fiber being free of any particles having a size not smaller than 1 μm.

4,678,276

OBJECTIVE LENS DRIVE/SUPPORT MECHANISM IN AN OPTICAL DISC PLAYER

Yoshihiro Sekimoto; Shigeo Terashima, both of Tenri; Kiyoshi Kumata, Tsuzuki, and Toshiyuki Tanaka, Kadoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 14, 1984, Ser. No. 681,818
Claims priority, application Japan, Dec. 26, 1983, 58-250747
Int. Cl.[4] G02B *7/02;* F16F *7/12, 15/04*
U.S. Cl. 350—247 5 Claims

1. An objective lens drive/support mechanism comprising:
shaft means;
an objective lens support member slidably and rotatably secured to said shaft means;
an objective lens disposed in said objective lens support member at a position which is extended from said shaft means by a predetermined distance;
drive means for slidably shifting said objective lens support member along said shaft means, and for rotating said objective lens support member around said shaft means;
a symmetrical, elastic damping member secured to said shaft means at its center portion thereof; and

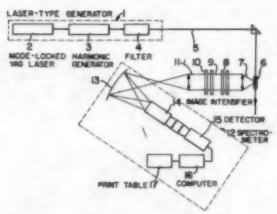
securing means tightly connecting opposing ends of said symmetrical, elastic damping member to said objective lens support member.

4,678,277

METHOD OF DISCRIMINATION IN SPECTROMETRY

Michel Delhaye, 80, rue Thiers; Andrë Deffontaine, 39, rue Degas; Andrë Chapput, 78, rue Faidherbe, all of 59650 Villeneuve d'Ascq; Michel Bridoux, 1, rue Jean Mermoz, 59890 Quesnoy sur Deule, and Edouard Da Silva, Place de l'Eglise, 60390 Auneuil, all of France

Filed Sep. 26, 1984, Ser. No. 655,024
Claims priority, application France, Sep. 30, 1983, 83 15939
Int. Cl.[4] G01J *3/44;* G01N *21/65*
U.S. Cl. 356—301 10 Claims

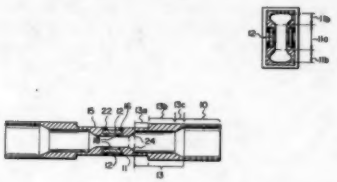


1. A method of analysis of a sample by Raman spectrometry and discriminating fluorescence and elimination thereof in the analysis comprising, exciting the sample with a pulsed laser incident light wave for causing the sample to emit light, introducing the emitted light from the sample into a two-beam or a multiple-beam interferometer in which the round trip of the multiply reflected light is significantly longer than the duration of the incident light wave and shorter in duration than fluorescence from the sample, collecting the emitted light at the outlet of the interferometer, and spectrometrically analyzing the collected emitted light.

4,678,278
SIGHT TUBE FOR MONITORING OF FLUIDS

Albert D. Friesen, and Walter F. Grassler, both of Winnipeg, Canada, assignors to The Winnipeg Rh Institute Inc., Winnipeg, Canada

Filed Dec. 4, 1984, Ser. No. 677,860
Claims priority, application Canada, Aug. 16, 1984, 461169
Int. Cl.[4] G02B 5/00
U.S. Cl. 350—319 3 Claims

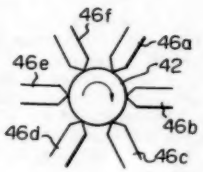


1. A sight tube of the kind having windows at opposite sides and by means of which a flowing fluid may be monitored by light passing through the windows, wherein the interior of the tube has a central section with a flat sided portion between and parallel to said windows, said interim having the flat sided portion flanked by two side portions which are thicker than said flat sided portion in planes perpendicular to a medial plane of the flat sided portion, the tube having end sections of circular cross section joined to the central section by intermediate sections which provide gradual transitions from the end sections to the central section.

4,678,279
METHOD OF PRODUCING A PHOTORADIATOR DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed May 2, 1983, Ser. No. 490,685
Claims priority, application Japan, May 11, 1982, 57-78809; May 11, 1982, 57-78810; Jun. 7, 1982, 57-97459; Jun. 10, 1982, 57-99775
Int. Cl.[4] G02B 00/00; B26D 3/06; C03B 9/46
U.S. Cl. 350—320 4 Claims



1. A method of producing a photoradiator for radiating converged light conducted therethrough radially outwardly to the ambience, comprising the steps of:

(a) supporting an elongate light conducting member means with its longitudinal axis substantially vertically disposed;

(b) supporting said vertically disposed elongate light conducting member means simultaneously at a plurality of axially spaced and a plurality of circumferentially spaced locations of the light conducting member means by axially spacing a plurality of cutting tool member means at substantially equal axial distances from each other along the axial length of said light conducting member means and circumferentially spacing said plurality of cutting tool member means at substantially equal angular distances from each other about the circumference of said light conducting member means by placing the cutting edges of said plurality of cutting tool member means in contact with the periphery of the light conducting member means at said plurality of axially and circumferentially spaced locations of said light member means;

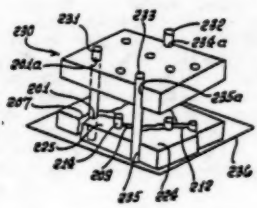
(c) machining the periphery of the vertically disposed light conducting member means simultaneously at a plurality of axially and circumferentially spaced locations of the light conducting member means utilizing said cutting edges of said plurality of cutting tool member means to simultaneously form a plurality of grooves in said light conducting member means so that the light advancing through the light conducting member means becomes radiated by reflection at a wall of said grooves, whereby said cutting tool member means holds the axis of said light conducting member means substantially fixed in position during said machining; and

(d) tensioning said light conducting member means during said machining step.

4,678,280
METHOD OF CONSTRUCTING A SEGMENTED MIRROR

C. James Blom, Bakersfield, Calif., assignor to Roxor Corporation, Bakersfield, Calif.

Continuation-in-part of Ser. No. 578,688, Feb. 9, 1984, Pat. No. 4,560,256, which is a continuation of Ser. No. 385,544, Jun. 7, 1982, Pat. No. 4,470,665, which is a continuation-in-part of Ser. No. 233,106, Feb. 10, 1981, Pat. No. 4,368,951, which is a continuation-in-part of Ser. No. 109,970, Jan. 7, 1980, abandoned. This application Mar. 4, 1985, Ser. No. 708,527
The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.
Int. Cl.[4] G02B 5/08
U.S. Cl. 350—320 18 Claims



1. The method of constructing a segmented mirror, the mirror comprising, in combination

(a) a myriad of surfaces carried by the support, certain of said surfaces dimensionally offset from one another in a common direction generally parallel to the general direction of incident radiation to be reflected, said surfaces being radiation reflecting surfaces each oriented in such a way that as a group they collectively reflect radiation essentially as if they were a continuous reflecting surface,

(b) each of said surfaces having a periphery comprising a series of line segments which are connected, curved or linear, the peripheries of said surfaces, when projected in said common offset direction onto a plane perpendicular thereto, contiguously conforming to one another,

said method including providing a die, used for casting the mirror segmented surface, and constructing the die from a casting of a continuous surface of the desired shape by cutting in said common direction said casting, or a casting thereof, into small segments, and the segment cross sections being of any outline except circular, in order that the segments may be translated with respect to contiguous segments while maintaining integrity of the composite reflection from all the translated surfaces, and wherein said segment sides define surfaces with irregular outlines which are substantially non-repetitive.

4,678,281

CIRCUIT FOR THE ACTUATION OF LIQUID CRYSTAL LAYERS IN MIRRORS

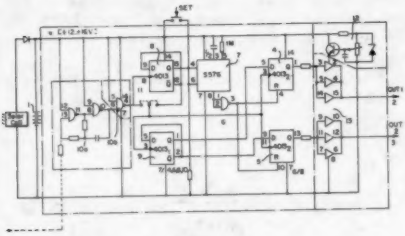
Rainer Bauer, D-6072 Dreieich, An der Dampfmühle 12, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,218

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1984, 3411048

Int. Cl.[4] G02F *1/133*

U.S. Cl. 350—331 R **8 Claims**



1. A dimmable composite pane comprising:

two polarizing filter layers;

two transparent support layers;

a liquid crystal layer bounded on a first and a second side by conducting layers positioned between the two polarizing filter layers and arranged on the two transparent support layers;

means for controlling the pane including first and second flip-flop means for feeding the first and second conducting layers, said flip-flop means having outputs connected to respective inputs of said conducting layers;

dimmer means for simultaneous resetting, in a frequency dependent manner, of the flip-flop means connected to a reset input of the first and second flip-flop means;

means for driving said flip-flop means including means for providing synchronously timed input signals such that the input signal for the first flip-flop means is 180 degrees out of phase with the input signal for the second flip-flop means and timing means for providing clock signals to said first and second flip-flop means at a rate twice the frequency of the synchronously timed input signals.

4,678,282

ACTIVE DISPLAY MATRIX ADDRESSABLE WITHOUT CROSSED LINES ON ANY ONE SUBSTRATE AND METHOD OF USING THE SAME

Zvi Yaniv; Walter E. Chapelle, both of Southfield; Shui-Chih A. Lien, Clawson, and Mohshi Yang, Troy, all of Mich., assignors to Ovonic Imaging Systems, Inc., Troy, Mich.

Filed Feb. 19, 1985, Ser. No. 702,996

Int. Cl.[4] G02F *1/133*

U.S. Cl. 350—334 **39 Claims**

1. A light influencing display comprising:

first and second insulative surfaces;

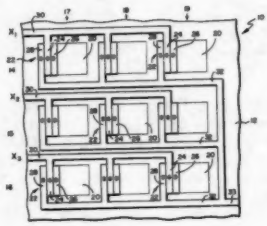
a plurality of pixels, each including a first electrode formed on the first surface and an opposing second electrode formed on the second surface, with said pixels being divided into a plurality of pixel groups, each consisting of a separate plurality of pixels;

a corresponding plurality of three terminal control devices formed of deposited semiconductor material on the first surface, with one such control device being formed in asociatation with each of said pixels, with each control device having two current path terminals and a control terminal which controls the conductivity between those two current path terminals, and with a first of the current path terminals of each control device being connected to the first pixel electrode of its associated pixel;

a separate conductive voltage supply lead formed on the first surface in association with each of said pixel groups, with each of said voltage supply leads being connected to the second current path terminals of the control devices associated with its pixel group;

a separate conductive control lead formed on the first surface in association with each of said pixel groups, with each of said control leads being connected to the control terminals of the control devices associated with its pixel group;

a plurality of conductive data leads formed on the second surface, with a different one of such data leads being electrically connected to each separate second pixel electrode of a given pixel group for selectively supplying data voltages to the second pixel electrodes of said given



group, with individual ones of such data leads being connected to at least one second pixel electrode in each of a plurality of pixel groups;

light influencing display material disposed between the first and second electrodes of each pixel; and

the voltage supply leads and the control leads not crossing each other;

whereby a desired voltage can be applied between the electrodes of a given pixel by using a selected control lead to turn on the conductivity of the control device associated with its pixel group, thus effectively connecting the pixel's first electrode to a voltage supply lead, and by using a selected data lead to supply a selected voltage to the pixel's second electrode.

4,678,283

TRIALKANOYLOXYSILANES

Franz-Heinrich Kreuzer, Martinsried; Rudolf Eidenschink, Münster, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,210

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331515

Int. Cl.[4] G02F *1/13*; C09K *19/56, 19/54*; C07F *7/04*

U.S. Cl. 350—340 **19 Claims**

1. A trialkanoyloxysilane of the formula

$$R^1—A^1—A^2—O—C_nH_{2n}—Si(OOCR^2)_3$$

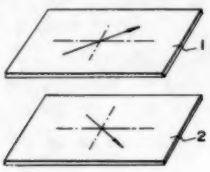
wherein R^1 is H, alkyl of 1–10 C atoms, alkyl of 1–10 C atoms wherein one or two non-adjacent CH_2 groups are replaced by oxygen atoms, F, Cl, Br or CN, R^2 is alkyl of 1–5 C atoms; A^1 and A^2 are independently each 1,4-phenylene (Phe) or 1,4-cyclohexylene (Cy) and n is 2, 3, 4, or 6.

15. A substrate useful in visual electronic display elements coated with a layer of a compound of claim **1**.

16. A coated substrate of claim **15** which is a glass substrate.

18. In an electro-optical visual electronic display element, comprising a liquid crystalline dielectric, and in contact therewith, a substrate coated with a layer which facilitates a homeotropic orientation in said dielectric, the improvement wherein the coated substrate is one of claim **16**.

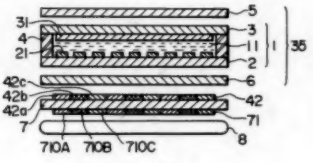
4,678,284
ANTIFLOCCULATING AGENT FOR SPACERS IN LIQUID CRYSTAL DISPLAYS
Yoshizo Tashiro, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Jul. 16, 1984, Ser. No. 630,947
Claims priority, application Japan, Jul. 16, 1983, 58-128726
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—344 4 Claims



1. In a liquid crystal display having two sheets of plastic film, transparent electrodes respectively formed on one sides of the sheets and opposed to each other with spacer particles therebetween, and liquid crystal material sealed-in between the electrodes,

the improvement wherein the spacer particles is coated with a hot melt adhesive containing an antiflocculating agent and is fixed to the sheets of plastic film by the adhesive.

4,678,285
LIQUID CRYSTAL COLOR DISPLAY DEVICE
Wasaburo Ohta, Yokohama; Takamichi Enomoto, Kanagawa, and Kiyohiro Uehara, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jan. 10, 1985, Ser. No. 690,267
Claims priority, application Japan, Jan. 13, 1984, 59-5094; Jun. 12, 1984, 59-120153; Oct. 11, 1984, 59-213175; Oct. 26, 1984, 59-225245; Oct. 26, 1984, 225246
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—345 19 Claims



1. A liquid crystal color display device for displaying a color image in response to a given image signal, comprising:

a liquid crystal cell composed of a liquid crystal material, a pair of transparent plates sandwiching said liquid crystal material therebetween, a transparent electrode mounted on one of said transparent plates and composed of plural electrode elements, and a flat transparent electrode mounted on the other transparent plate in confronting relation to said plural electrode elements;

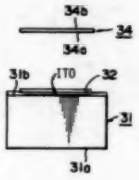
at least one polarizer;

a color filter composed of a plurality of filters for passing red, green, and blue fluorescent lights therethrough, said filters being disposed in alignment with respective of said electrode elements;

fluorescent light-emitting means comprising a fluorescent layer and a lamp for generating electromagnetic radiation, said fluorescent layer being composed of a plurality of fluorescent layer elements capable of emitting red, green, and blue fluorescent lights in response to application thereto of electromagnetic radiation from said lamp, said fluorescent layer elements being aligned with respective of the plurality of filters of said color filter; and

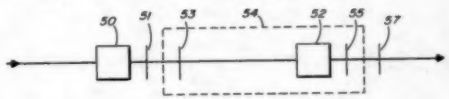
said liquid crystal cell, said at least one polarizer, and said lamp being successively arranged in the order named away from an observation side, said color filter being disposed more closely to the observation side than said fluorescent layer.

4,678,286
SPATIAL LIGHT MODULATOR
Tsutomu Hara, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan
Filed Jul. 31, 1985, Ser. No. 761,093
Claims priority, application Japan, Aug. 17, 1984, 59-171194
Int. Cl.[4] G02F *1/03*
U.S. Cl. 350—356 4 Claims



1. A spatial light modulator consisting an electron beam source formed within a vacuum envelope and an electro-optic crystal assembly to store electrons emitted from said electron beam source as a charge to change the optical property thereof, wherein said electro-optic crystal assembly consists of a pair of electro-optic crystal plates of the same material with different thickness combined through a transparent conductive film so that the surface of the thinner electro-optic crystal plate faces said electron beam source.

4,678,287
METHODS OF AND APPARATUS FOR TUNING A BIREFRINGENT OPTICAL FILTER
Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Filed Nov. 4, 1985, Ser. No. 794,901
Int. Cl.[4] G02B *27/28*
U.S. Cl. 350—404 14 Claims



1. A method of simultaneous and equal tuning of two birefringent elements in a birefringent optical filter having an optical axis with birefringent elements and wave plates oriented therealong, by the rotation about said optical axis of a single contiguous group of all optical birefringent elements and wave plates between first and second points along said axis,

said first point being positioned between first and second adjacent quarter-wave plates immediately adjacent one of said birefringent elements, and,

said second point being positioned between third and fourth adjacent quarter-wave plates immediately adjacent the other of said birefringent elements.

4,678,288

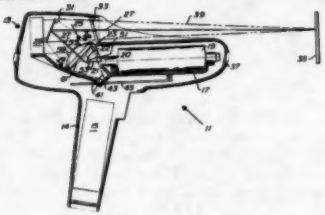
TRIFOCAL LENS FOR A LASER INSTRUMENT

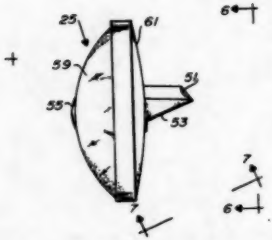
Randall J. Lonsdale, and Ronald A. Hellekson, both of Eugene, Oreg., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Apr. 27, 1984, Ser. No. 604,916

Int. Cl.[4] B29D *13/18*; G06K *7/10*

U.S. Cl. 350—432 **23 Claims**





1. A composite, single piece, lens system for a laser instrument of the kind used to read or to detect light reflected from a target which is spaced from the laser instrument, said lens system comprising,

an optical axis for the composite, single piece, lens system,

first optical means for receiving a laser beam which is generated and which is transmitted to the lens system at an angle which is off said optical axis and for routing the received laser beam onto said optical axis for transmission through the lens system toward the target,

second optical means for collecting light reflected from the target and for imaging the collected light along said optical axis to detector means associated with the lens system,

said first optical means including a beam expander element, a prism, and a focusing element,

said second optical means including a collection lens having a first curved surface on a side which receives the light reflected from the target and a second curved surface on a side facing the detector means, and

wherein the first optical means and the second optical means are embodied in a composite, single piece lens structure.

4,678,289

APPARATUS FOR THE DEFLECTION OF A LIGHT BEAM

Antoon Mattelin, Oostkamp, and Bert Paquet, Opwijk, both of Belgium, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,349

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435167

Int. Cl.[4] G02B *26/08*

U.S. Cl. 350—486 **19 Claims**

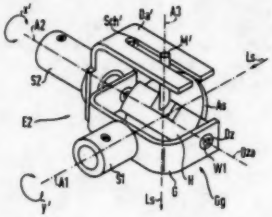
19. An apparatus for the deflection of a light beam in two mutually perpendicular directions comprising:

a single deflection mirror;

a first means for rotating said mirror about a first axis;

a second means for rotating said mirror about a second axis perpendicular to said first axis;

rotation of said mirror by said first means having no effect on a satial position of said second means, and rotation of said mirror by said second means having no effect on a spatial position of said first means;



whereby rotation about each axis is accomplished independently.

4,678,290

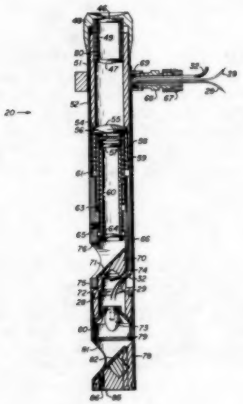
APPARATUS FOR VISUAL INSPECTION OF CLOSED MACHINERY

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Aug. 30, 1985, Ser. No. 771,349

Int. Cl.[4] A61B *1/00*; G02B *23/00*; F21L *7/00*; F21V *29/00*

U.S. Cl. 350—506 **17 Claims**



1. An inspection apparatus for visual inspection of the interior of poorly illuminated machinery through a small opening into the machinery, comprising:

(a) an elongate housing having

(1) an optical system therein,

(2) a viewable field opening,

(3) an eye piece to enable viewing of a specified field width,

(4) wherein the optical system forms a view at the eye piece of specified field determined by the azimuthal direction of the opening

(b) closed chamber means in said housing;

(c) light forming means in said chamber means;

(d) light directing means supported by said housing and located to direct light from said chamber means away from said housing and in an azimuthal direction to illuminate the field viewed by said optical system;

(e) wherein said housing has means to isolate said light forming means from the exterior outside said closed chamber means;

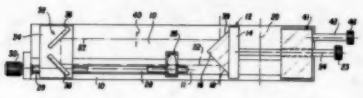
(f) wherein said light forming means and said chamber means are connected through a flow line to a source of nonflammable gas to establish an atmosphere of nonflammable gas surrounding said light forming means.

4,678,291

OPTICAL ARRANGEMENT FOR MICROSCOPES

Georg N. Nyman; Ferdinand Pauliny, and Klaus P. Schindl, all of Vienna, Austria, assignors to C. Reichert Optische Werke AG, Vienna, Austria

Filed Dec. 14, 1984, Ser. No. 681,780
Int. Cl.⁴ G02B *7/02, 7/18, 21/18*
U.S. Cl. 350—510 **13 Claims**



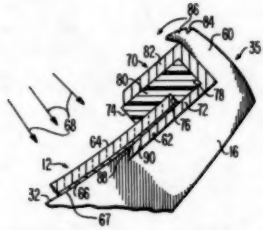
1. An optical arrangement for a microscope comprising a main beam path in which a microscope objective and an observation tube are located, a supplementary beam path which can be selectively interposed between the microscope objective and the observation tube in place of a portion of the main beam path, and an optical deflection element which can be inserted into the main beam path and withdrawn from the main beam path to select between the main beam path and the supplementary beam path whereby the beam from the microscope objective is deflected laterally away into the supplementary beam path when the optical deflection element is inserted into the optical main beam path, wherein said supplementary beam path includes at least first, second and third optical surfaces each deflecting the beam, the third optical surface deflecting the supplementary beam path into the observation tube, and a Bertrand lens and a field-limiting element associated with the Bertrand lens are provided between the optical deflection element and the third optical surface and wherein the first and second optical surfaces and the Bertrand lens are displaceable along the beam path to accommodate different microscope objective, the position of the field-limiting element being unchanged.

4,678,292

CURVED STRUCTURE AND METHOD FOR MAKING SAME

Kazuo Miyatani, and Isao Sato, both of Tokyo, Japan, assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 259,515, May 1, 1981, abandoned. This application Jun. 27, 1984, Ser. No. 625,025
Int. Cl.⁴ G02B *5/10;* F24J *2/46*
U.S. Cl. 350—609 **19 Claims**



15. An article of manufacture comprising:

a bent sheet of glass having substantially negligible cords and inclusions and internal compressive and tensile stresses tending to flatten said sheet, the neutral surface of said bent sheet being about midway between the front and rear surfaces of the sheet;

a reflective coating deposted on a surface of said sheet, said coating having negligible support for said tensile stresses; and

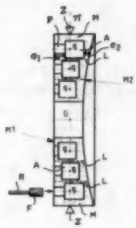
means for retaining said sheet at its edges in the bent state, wherein the depth of the bend is greater than 5% the width dimension across the bend.

4,678,293

REDUCED-WEIGHT MIRROR

Paseri Jacques, Bris Sous Forges, France, assignor to Recherches et Etudes d'Optique et de Sciences Connexes, Longjumeau, France

Filed Feb. 26, 1986, Ser. No. 833,206
Claims priority, application France, Oct. 23, 1985, 85 15747
Int. Cl.⁴ G02B *5/10, 7/18*
U.S. Cl. 350—609 **7 Claims**



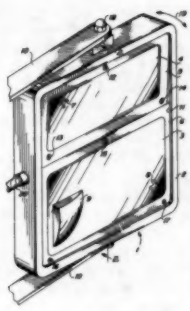
1. A mirror having a non-plane reflecting face, said mirror being constituted by a mass of optical material having cells formed therein in such a manner that the center of gravity of the cell-surrounding portions of the mirror lie substantially in the same plane as the center of gravity of the mirror as a whole.

4,678,294

MIRROR ASSEMBLY FOR DETERMINING DISTANCE TO PASSED VEHICLE

Willard R. Van Nostrand, 3737 Calle Cortez, Tucson, Ariz. 85716

Filed Dec. 3, 1985, Ser. No. 804,173
Int. Cl.⁴ G02B *5/08*
U.S. Cl. 350—611 **10 Claims**



1. A rearview mirror assembly for attachment to a passing vehicle, the rearview mirror assembly comprising in combination:

(a) a first plane mirror;

(b) first supporting means for supporting the first plane mirror in an orientation rearward and outward relative to

the passenger side of the passing vehicle such that an image of the headlights of a passed vehicle is reflected to the eye of a driver of the passing vehicle and appears to the driver to move diagonally across the first plane mirror, and to attain a predetermined relationship with the first plane mirror only when the passing vehicle is a predetermined distance ahead of the passed vehicle, and when the passed vehicle is in a driving lane of a road and the passing vehicle is in a passing lane adjacent to the driving lane;

(c) a second plane mirror and second supporting means for supporting the second plane mirror to reflect an image of a distant rearward portion of the driving lane behind the passing vehicle to the driver of the passing vehicle;

(d) unitary supporting means for supporting the first and second supporting means outside of the passing vehicle on a passenger side of the passing vehicle, reltive to the unitary supporting means; and

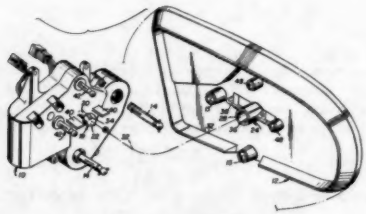
(e) adjustment means in each of the first and second supporting means, respectively, for effectuating individual adjustment of the first and second plane mirrors, respectively.

4,678,295

MEMORY POSITIONING SYSTEM FOR REMOTE CONTROL REAR-VIEW MIRROR

Robert J. Fisher, Livonia, Mich., assignor to Magna International Inc, Downsview, Canada

Filed Apr. 5, 1985, Ser. No. 720,363
Int. Cl.[4] B60R *1/06;* G02B *7/18*
U.S. Cl. 350—634 **18 Claims**



1. In a vehicle mirror of the type including a base, a mirror casing, means for mounting said mirror casing relative to said base for pivotal movement about first and second mutually perpendicular intersecting axes between limiting positions and against substantial movement about a third intersecting axis which is mutually perpendicular to said first and second axes, sensing means for sensing the position of pivotal movement of said mirror casing with respect to said base about said first and second axes, and automatic return means including electric motor means operable in response to said sensing means for moving said mirror casing with respect to said base about said first and second axes from any position thereof into a selected position previously sensed by said sensing means, the improvement which comprises

said sensing means including first and second elongated mirror position sensing members each having first and second ends,

means for pivotally connecting the first end of said first sensing member to said mirror casing at a first effective point of connection lying on the second of said intersecting axes,

means for mounting the second end of said first sensing member on said base for reciprocation therein along a first parallel axis spaced a first fixed distance in substantially parallel relation with said third axis in such a way as to accomodate the movement of the first effective point of connection of the first end thereof along an arcuate path of variable perpendicular distance from said third axis as the mirror casing is pivoted between said limiting positions about the first of said intersecting axes,

means for pivotally connecting the first end of said second sensing member to said mirror casing at a second effective point of connection lying on the first of said intersecting axes,

means for mounting the second end of said second sensing member on said base for reciprocation therein along a second parallel axis spaced a second fixed distance in substantially parallel relation with said third axis in such a way as to accomodate the movement of the second effective point of connection of the first end thereof along an arcuate path of variable perpendicular distance from said third axis as said mirror casing is pivoted between said limiting positions about the second of said intersecting axes,

said first and second effective points of connection each being a maximum perpendicular distance away from said third intersecting axis when at a position substantially midway between its limiting positions and being a minimum perpendicular distance away from said third intersecting axis when at its limiting positions,

said first and second distances each being generally equal to the average of the maximum and minimum perpendicular distances associated therewith.

4,678,296

NIGHT DRIVING DAZZLE PROTECTION SYSTEM

Robert B. Smith, 140 Westland Ave., Rochester, N.Y. 14618

Filed Nov. 1, 1984, Ser. No. 667,374
Int. Cl.[4] G02C *7/16*
U.S. Cl. 351—45 **17 Claims**

1. A night driving dazzle protection system using screened and unscreened portions of right and left eyeglass regions in front of a driver's eyes, said protection system, as viewed by the driver, comprising:

a. screened portions of said eyeglass regions having anti-dazzle screen material transmitting less than 40% of incident light;

b. octants of said right and left eyeglass regions located between about 7:30 o'clock and about 9:00 o'clock being screened for the driver's left eyeglass region and unscreened for the driver's right eyeglass region;

c. an upper portion of one of said eyeglass regions being screened from about 9:00 o'clock to about 3:00 o'clock; and

d. a screened portion of said right eyeglass region being spaced from an optical axis aligned with the entrance pupil of the driver's right eye and a screened portion of said left eyeglass region intersecting an optical axis aligned with the entrance pupil of the driver's left eye.

4,678,297

OPHTHALMIC INSTRUMENT

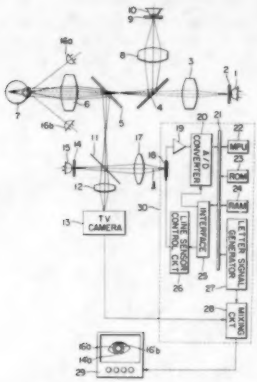
Yasuyuki Ishikawa, Kawaguchi, and Isao Matsumura, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 555,528, Nov. 28, 1983, abandoned. This application Apr. 10, 1986, Ser. No. 851,861

Claims priority, application Japan, Nov. 30, 1982, 57-210937

Int. Cl.[4] A61B *3/14, 3/10*

U.S. Cl. 351—208 **10 Claims**



1. An ophthalmic instrument, comprising:

an objective lens;

means for projecting an eye-measuring target mark at the position substantially conjugate with the fundus of an eye to be examined through said objective lens onto the fundus of the eye to be examined;

first and second beam splitting means each for splitting a light beam of the target mark and each being disposed to the side of said objective lens opposite to the side thereof on which the eye to be examined is disposed;

a first detecting system for measuring predetermined information about a refractive power of the eye by projecting the light of said target mark reflected at the fundus of the eye onto a first detecting device through said objective lens, said first detecting device being provided at the position substantially conjugate with the fundus of the eye in a branched optical path formed by said first beam splitting means; and

a second detecting system, including a second detecting device, for detecting the state of alignment between the eye to be examined and said ophthalmic instrument by projecting the light of said target mark reflected by the cornea of the eye onto said second detecting device through said objective lens, said second detecting device being provided at the position substantially conjugate with the corneal reflection image of said target mark in a branched optical path formed by said second beam splitting means.

4,678,298

METHOD AND APPARATUS FOR THREE-DIMENSIONAL PHOTOGRAPHY

Zoran Perisic, Gwynfenton, White Well, St. Teath, Nr. Bodmin, Cornwall, United Kingdom

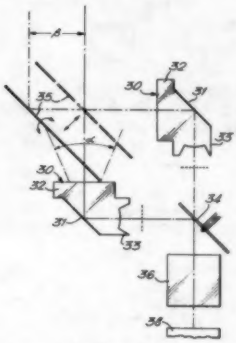
Continuation-in-part of Ser. No. 553,709, Nov. 21, 1983, abandoned. This application Jan. 27, 1986, Ser. No. 822,872

Claims priority, application United Kingdom, Nov. 22, 1982, 8233258; Feb. 21, 1983, 8304715

Int. Cl.[4] G03B *35/02*

U.S. Cl. 352—62 **8 Claims**

1. Apparatus for providing left and right eye images along the lens axis of a camera whereby left and right eye images are recorded alternately on film strip so as to provide a three dimensional impression, the apparatus comprising first means for receiving a first eye image along a first axis, second means for receiving a second eye image along a second axis spaced from the first axis by a distance substantially consistent with the interocular distance of natural eyes, means for resolving said first and second eye images alternately along the lens axis of the camera, the first and second receiving means each including respective first and second wide angle lens means providing a horizontal angular spread consistent with the horizontal angular spread of vision of natural eyes of between 40° and 60°, and means for adjusting the convergence of the first and second axes, the first eye axis and second eye axis



being spaced from the lens axis, the first and second lens means being arranged to deflect their respective first and second eye images through 90°, and the resolving means comprising two reflective means, one reflective means aligned with the first eye axis whereby, via the first lens means, the first eye axis is deflected coincident with an optical path to the lens axis and intersects the second eye axis, and the other reflective means being positioned intermittently transverse to the optical path to the lens axis in synchronism with a drive motor of the camera at said intersection, whereby during the reflecting duration of the other reflective means the second eye image passes along the lens axis and, during the non-reflective duration thereof, the first eye image passes along the lens axis whereby left and right eye images may be recorded alternately on film strip.

4,678,299

CAMERA DEVICE FOR ENCODING CONVENTIONAL FILM CARTRIDGE

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 12, 1985, Ser. No. 775,271

Int. Cl.[4] G03B *7/00*

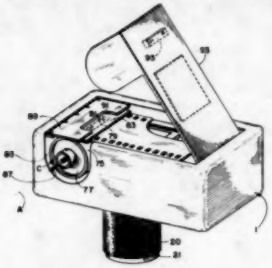
U.S. Cl. 354—21 **9 Claims**

1. An improved photographic camera for use with a film cartridge, wherein said camera is of the type having a loading chamber for receiving the cartridge in an axial direction, wherein the improvement comprises:

continuously active encoding means for applying an alterable code mark to a film cartridge received in said loading chamber, said encoding means having a finite range of influence within which the received cartridge is encoded with the alterable mark; and

means supporting said encoding means for movement

towards the received cartridge at least until the cartridge is within the finite range of said encoding means, to encode the cartridge with the alterable mark, and for movement away from the received cartridge at least until the



cartridge is outside the finite range of said encoding means, to permit the cartridge to be removed in an axial direction from said loading chamber without said cartridge removal altering the encoded mark.

4,678,300

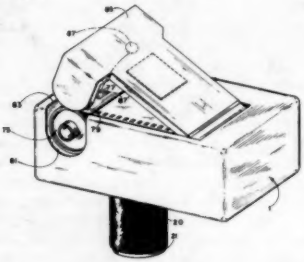
APPARATUS AND METHOD FOR IDENTIFYING A FILM CARTRIDGE USED IN A PARTICULAR TYPE CAMERA

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 12, 1985, Ser. No. 775,296

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—21 **8 Claims**



1. In the combination of (a) a film cartridge, (b) a photographic camera having a loading chamber for receiving the cartridge, and (c) a back door supported for closing movement to cover said loading chamber, the improvement comprising:

said cartridge including a discrete dedicated area on an exterior surface of the cartridge and indicator means arranged within said dedicated area for physical alteration to provide a visible indication that the cartridge was used in said camera; and

said camera including means mounted on said back door for movement when the door is closed to substantially contact said indicator means of a cartridge in said loading chamber for physically altering the indicator means, whereby a visible indication will be provided on the cartridge to indicate that said cartridge was used in the camera.

4,678,301

APPARATUS FOR IN-CAMERA IDENTITY MARKING OF FILM

Manuel Denner, 249 W. 29th St., New York, N.Y. 10001

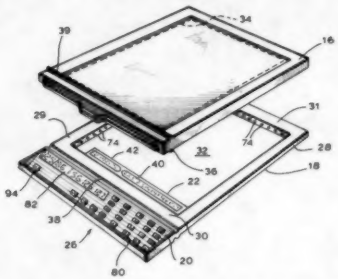
Filed May 7, 1986, Ser. No. 860,522

Int. Cl.[4] G03B *17/24, 17/26*

U.S. Cl. 354—106 **17 Claims**

1. In a camera having a camera body with respective front and rear ends, a background viewing screen unit carried on the rear end of said body, a film cassette for holding a rectangular-shaped strip of unexposed photographic film, said cassette being removably receivable in said body forwardly adjacent said viewing screen, and a frame member disposed in said body in front of said cassette, said frame member having a generally rectangular opening therein which registers with the strip of film and is defined by a correspondingly configured rectangular inner frame periphery, an encoder module for marking identification data on the film, the module being mounted on said frame at the inner periphery thereof and comprising

a lightproof housing, the housing having a window therein which dispcses in facing confrontation with an edge por-



tion of a cassette held film strip, and electrically operated means for generating and projecting discrete light beams of identification characters through said window onto said film strip edge portion to expose an identification image thereon, said generating and projecting means including circuit components and terminals therefor associated with operation of said generating and projecting means, said frame member having complemental terminal connector means receptive of said terminals in each of the frame inner peripheral sides whereby said module can be mounted selectively on any one of said inner peripheral sides and electrical power potential available at said terminal connector means communicated to said generating and projecting means for operating same.

4,678,302

APPARATUS FOR HANDLING LIGHT-SENSITIVE PHOTOGRAPHIC SHEET MATERIAL IN AMBIENT LIGHT

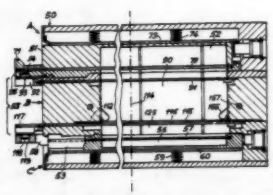
Carl Koch, Stetten, Switzerland, assignor to Sinar AG Schaffhausen, Feuerthalen, Switzerland

Filed Nov. 4, 1985, Ser. No. 794,797

Claims priority, application Switzerland, Nov. 3, 1984, 5262/84

Int. Cl.[4] G03B *17/24, 19/10;* **B65H** *3/46*

U.S. Cl. 354—107 **29 Claims**



1. An apparatus for handling light-sensitive photographic sheet material in ambient light, comprising a separating device for separating individual sheets from a stack comprising a plurality of sheets of the same shape and size, and for transferring the separated sheets into a cassette intended for mounting

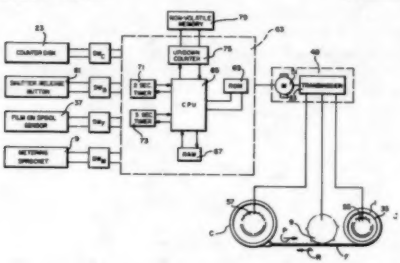
on a photographic camera, or into a feed inlet of a developing apparatus, wherewith the separating device has an entrance opening for feeding sheet material and a delivery opening for delivering each individual sheet, and is provided with a movable separating organ for separating individual sheets from stack, said separating organ being disposed between said entrance opening and said delivery opening, and the separating device also is provided with connecting means, which connecting means allow the delivery opening of the separating device to be joined to the cassette or to a connecting piece on the feed inlet of the developing apparatus, said joining being releasable and being protected ambient light; characterized in that the separating device (**55**) has an accumulation space (**90**) for a stack of the sheet material, between the entrance opening of said separating device and the separating organ (**112**); further in that the entrance opening of the accumulating space (**90**) of the separating device (**55**) is provided with a closure organ (**91**) which is movable into a closed position which closes off the entrance opening in light-tight fashion, and into an open position which completely exposes the entrance opening; further in that support surfaces (**150, 151**) for supporting the edge parts of the instantaneously bottom-most sheet of the stack are provided in the separating organ (**112**) of the separating device (**55**); further in that the separating device (**55**) comprises hold-down organs (**115**) which extend into the accumulation space (**90**), for pressing the stack against the support surfaces (**150, 151**); further in that each of the hold-down organs (**155**) is movable from its pressing position into an inactive position in which it is disposed outside the accumulation space (**90**), in order to enable the stack to be inserted into the accumulation space; and in that drive means (**157–174**) are provided to move the hold-down organs (**155**) into their respective pressure positions and into their respective inactive positions, which drive means are controllable by the closure organ (**91**) associated with the entrance opening of the accumulation space (**90**), such that each of the hold-down organs (**155**) is automatically brought into its inactive position when the closure organ (**91**) is moved into its open position, and when the closure organ (**91**) is moved into its closed position each said hold-down organ is automatically moved into its pressure position.

4,678,303

FILM-ON-SPOOL SENSOR FOR DETERMINING MODE OF OPERATION OF FILM TRANSPORT MECHANISM IN CAMERA

Stephen G. Malloy Desormeaux, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1986, Ser. No. 871,040
Int. Cl.[4] G03B *1/18*
U.S. Cl. 354—173.11 **4 Claims**



1. An improved photographic camera of the type wherein (a) motorized film transport means is operable in a load mode to first prewind a substantial length of an unexposed filmstrip from a light-tight cartridge onto a take-up spool without exposing any frames on the filmstrip and to then rewind a predetermined length of the filmstrip off said take-up spool to position a first frame for exposure and is operable in a picture-taking mode to rewind the filmstrip one frame at a time back into the cartridge after each frame is exposed, and (b) a shutter release member is actuatable to initiate operation of said motorized film transport means in its load or picture-taking mode, and wherein the improvement comprises:

film-on-spool sensing means for sensing whether film is present on said take-up spool or the spool is empty; and

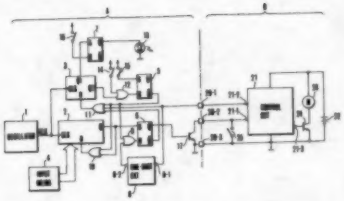
control means, responsive to actuation of said shutter release member when said film-on-spool sensing means senses that said take-up spool is empty, for operating said motorized film transport means in its load mode, and responsive to actuation of said shutter release member when said film-on-spool sensing means senses that film is present on said take-up spool, for operating said motorized film transport means in its picture-taking mode, whereby said film-on-spool sensing means will determine the mode of operation of said motorized film transport means.

4,678,304

INTERVAL SHOOTING DEVICE

Jiro Kazumi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,823
Claims priority, application Japan, Apr. 2, 1985, 60-069472
Int. Cl.[4] G03B *1/12, 17/40*
U.S. Cl. 354—173.11 **10 Claims**



1. An interval timer device for a camera in which a train of actuating signals for releasing the camera are produced with a prescribed period, comprising:

(a) a timer circuit responsive to termination of an exposure of the camera for counting time;

(b) a circuit for stopping said timer circuit from further counting time when a shutter charging operation or a film winding operation that follows the termination of the exposure by a motor circuit completes; and

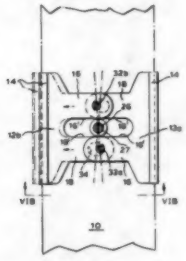
(c) a prohibiting circuit for stopping said control operation of said interval timer device when the time counting of said timer circuit has been performed for a prescribed time.

4,678,305

PHOTOGRAPHIC CAMERA

James F. Flitton, Lightwater, England, assignor to Photo-Me International PCL, Surrey, England

Filed Mar. 24, 1986, Ser. No. 843,319
Claims priority, application United Kingdom, Sep. 27, 1985, 8523912
Int. Cl.[4] G03B *17/00, 29/00*
U.S. Cl. 354—203 **10 Claims**



1. A photographic camera comprising two guides for engaging mutually opposite edge portions of photographic film at an

exposure plane where said film is exposed to take a photograph, means for supporting each guide in said position of engagement with mutually opposite edge portions and substantially simultaneously temporarily retracting each guide laterally of a respective edge portion so that the edge portions also may be exposed during the taking of said photograph.

4,678,306

FILM FEEDING INDICATION DEVICE FOR CAMERA

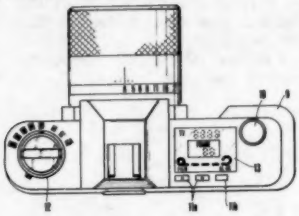
Masayoshi Kiuchi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,382

Claims priority, application Japan, Oct. 17, 1984, 59-217927

Int. Cl.[4] G03B *17/18, 17/36*

U.S. Cl. 354—217 **6 Claims**



1. A film feeding indication device for a camera, comprising:

(a) monitor signal forming means for forming a monitor signal corresponding to the film feeding;

(b) detection means for generating an output when the signal of said monitor signal forming means reaches a predetermined value indicating a normal film feeding;

(c) indication means for instructing completion of the film feeding in response to the output of said detection means; and

(d) control means for causing said indication means to instruct completion of the film feeding irrespective of the output of the detection means when the film feeding by said film feeding means has been completed before the signal of said monitor signal forming means reaches the predetermined value.

4,678,307

DEVICE FOR PROCESSING EXPOSED PHOTOGRAPHIC FILM COILED ON A SPOOL

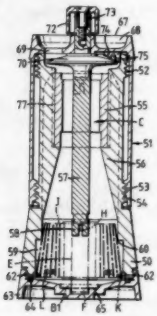
Brian F. Moss, Chelford; Richard J. Brent, Bramhall, and Ian B. Pilkington, Prestbury, NR Macclesfield, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 15, 1985, Ser. No. 787,284

Claims priority, application United Kingdom, Oct. 26, 1984, 8427101

Int. Cl.[4] G03D *13/06*

U.S. Cl. 354—313 **5 Claims**



1. A device for processing a roll of exposed film coiled on a spool which comprises a cylindrical light-tight container of sufficient diameter and height to accomodate the film coiled on the spool, a light-tight lid to close the container, barb means attached to or adjacent to the internal wall of the container so located to retain the film when the film is placed in the container and means connected with the spool for enabling the spool with the coiled film to be rotated in either direction.

4,678,308

PROCESSING DEVICE

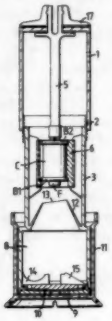
Brian F. Moss, Chelford, and Richard J. Brent, Handforth, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 26, 1986, Ser. No. 832,938

Claims priority, application United Kingdom, Mar. 7, 1985, 8505843

Int. Cl.[4] G03D *13/06*

U.S. Cl. 354—313 **3 Claims**



1. An apparatus for the processing of film contained in a cassette, the cassette comprising a substantially cylindrical body formed with protruding light-tight longitudinally extending film exit slot means and having a top-most end cap and a lowermost end cap and accommodating a spool with the film wound thereon, said apparatus comprising a light-tight columnar body having a longitudinal axis and a block accommodated by said columnar body having a central aperture for receiving the cassette and retaining the cassette body, and having a space sufficiently large to receive from said cassette the spool with the film wound thereon, and a plunger adapted for engaging the spool of said cassette and being movable to force the lowermost cap off said cassette body and to move said spool and the film wound thereon out of said cassette body and into said space, said space being adapted for containing liquid for processing the film, the apparatus being characterised in that there is present in the apparatus below the block, but above the space for containing liquid, a shelf which is adapted to catch and retain the lowermost end cap as it is pushed off the cassette, the said shelf having in its middle a circular hole of sufficient diameter to allow passage therethrough of the spool with the film wound thereon, but too small to allow the end cap to fall through the shelf.

4,678,309

DEVICE FOR PROCESSING A ROLE OF EXPOSED FILM COILED ON A SPOOL

Brian F. Moss, Chelford, and Richard J. Brent, Handforth, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 26, 1986, Ser. No. 832,939

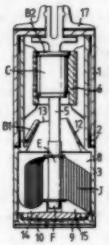
Claims priority, application United Kingdom, Mar. 7, 1985, 85 05896; Jun. 25, 1985, 85 16056

Int. Cl.[4] G03D *13/06*

U.S. Cl. 354—313 **17 Claims**

1. A device for processing a roll of exposed film coiled on a spool which comprises a cylindrical light-tight container

wherein the film on the spool is rotated and which is of sufficient diameter and height to accommodate the film loosely coiled on the spool, a light-tight lid to close the container, the device being characterised in that it comprises at least two radially extending raised members attached to the base of the



container so shaped that as the wound film is rotated in the container some of the convolutions of the film are at one instance bunched together whilst other convolutions are separated and means connectable to the spool for enabling the spool to be rotated when it is in the container.

4,678,310

DEVICE FOR TREATING PRINTING PLATES WITH A FLUID

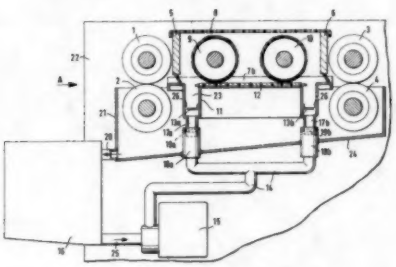
Hans Heist, Wiesbaden; Dieter Toepfer, Heidenrod, and Sylvia Britzke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 783,958

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437329

Int. Cl.[4] G03D *3/06, 13/00*

U.S. Cl. 354—319 **13 Claims**



1. A device for treating printing plates, comprising:

(1) a flooded trough having an inlet side and an outlet side and including:

a bottom comprising a guide plate table and an overflow channel extending around said table and being integral therewith;

a pair of side walls, a separate said wall located at each of said inlet side and outlet side of said flooded trough; and

a pair of containment elements, a separate said containment element supported on a separate said side wall, whereby said trough is adapted for passage of a printing plate horizontally therethrough;

(2) means for feeding fluid to said flooded trough;

(3) a collecting trough, having a bottom wall and being positioned below said flooded trough, for receiving overflow of fluid from said flooded trough; and

(4) means for releasably and rigidly engaging said fluid feeding means through the bottom wall of said collecting trough.

4,678,311

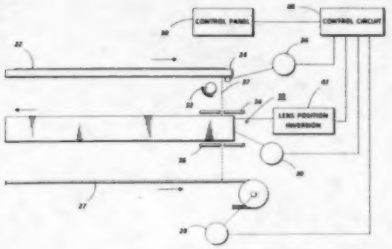
MULTI-MAGNIFICATION SHORT FOCAL LENGTH IMAGING SYSTEM

Robert P. Loce, Webster, and Melvin E. Deibler, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1986, Ser. No. 839,666

Int. Cl.[4] G03B *27/00*

U.S. Cl. 355—1 **9 Claims**



1. An optical system for an electrophotographic reproduction machine including a short focal length lens assembly for projecting an image of a document along an optical path onto a photosensitive image plane, said lens assembly comprising a planar unitary light transmissive member having a plurality of linear lens arrays formed integrally within said member, each lens array formed to project an image therethrough at a specific magnification value, (each array formed as an integral part of said lens assembly) and means adapted to form a light radiation field containing document information and to direct said field into the entrance face of a selected one of said lens arrays whereby an image of the document is projected onto the photosensitive image plane at the magnification value of the selected lens array.

4,678,312

ROTATABLE HEAD TYPE ELECTROPHOTOGRAPHIC APPARATUS, CORONA CHARGING ROTATABLE HEAD AND MOVEABLE ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT PROCESSING UNIT THEREFOR

Etuo Shiozawa; Shigeo Harada; Shuichi Ohtsuka, and Masahiro Ohnishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jul. 27, 1984, Ser. No. 635,069

Claims priority, application Japan, Aug. 1, 1983, 58-140882; Aug. 1, 1983, 58-140883; Aug. 1, 1983, 58-140884; Aug. 1, 1983, 58-140885

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **12 Claims**

1. A rotatable head type electrophotographic apparatus comprising:

(i) a moveable table,

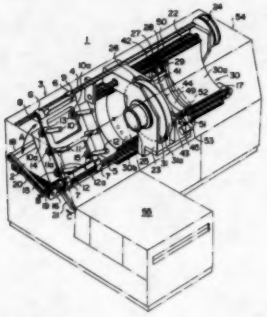
(ii) a rotatable head comprising a rotatable body which is rotatably supported on said moveable table, a corona charging electrode secured to said rotatable body to face outwardly of the circumferential surface of said rotatable body, and an electrostatic latent image forming light source secured to said rotatable body to face outwardly of the circumferential surface of said rotatable body,

(iii) a platen provided with an electrophotographic photosensitive material supporting surface extending in the axial direction of said rotatable head and curved to stand face to

face with the circumferential surface of said rotatable head,

(iv) a table movement means for moving said moveable table in the axial direction of said rotatable body,

(v) an electrophotographic development processing unit supported on said moveable table close to an electrophotographic photosensitive material supported on said platen,



(vi) a light source driving means for driving said light source in accordance with a predetermined modulating signal, and

(vii) a light shielding member for shielding the electrophotographic photosensitive material from external light during charging, exposure and development.

4,678,313

ELECTROPHOTOGRAPHIC RECORDING APPARATUS

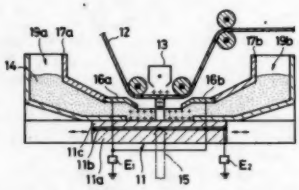
Tetsuro Konno; Yutaka Kanai, and Tetsuya Fujita, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,599

Claims priority, application Japan, May 15, 1985, 60-103137; May 15, 1985, 60-103139

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **5 Claims**



1. An electrophotographic recording apparatus comprising:

a pair of toner containers for accommodating a toner;

a pair of electrode plates which are disposed in openings in both of said toner containers opening such as to face each other, to which voltage for charging the toner delivered from said openings is applied, and which has a function of adjusting the layer of said toner;

a photosensitive member disposed such as to oppose at a lower portion of both of said toner containers the distal end of both of said electrode plates with a predetermined gap therewith and constituted by a transparent substratum, a transparent electrode, and a photoconductive layer, said photosensitive layer being reciprocated to the left and the right, and said toner in said toner containers, after being charged by said electrode plates, being supplied in a uniform thickness onto the surface of said photoconductive layer of said photosensitive member by virtue of the reciprocating movement of said photosensitive member;

light irradiating means for applying light from the side of said transparent substratum of said photosensitive member, the toner in a portion irradiated with light being charged to a polarity opposite to that of the initial charges via a selected photoconductive layer whose electrical resistance has decreased by being subjected to light irradiation by said light irradiating means as well as said transparent electrode; and

transferring means for causing said selected toner charged to opposite polarity to be transferred onto a recording medium opposed to the toner adhered to the surface of said photoconductive layer.

4,678,314

IMAGE FORMING APPARATUS

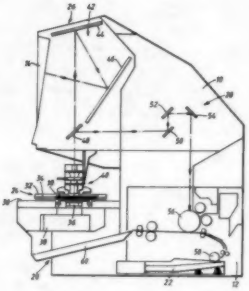
Kohachi Uchida, Sagamihara; Kunihiro Shibuya, Yokohama, and Hajime Nakamura, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

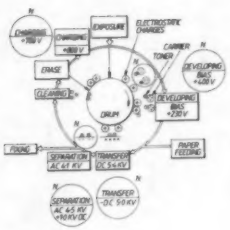
Filed Sep. 18, 1985, Ser. No. 777,447

Claims priority, application Japan, Oct. 3, 1984, 59-208587

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—5 **4 Claims**





1. An image forming apparatus comprising:

means for forming an electrostatic latent image with a first polarity on an image carrier;

first developing means for depositing a first developer charged with a second polarity, different from the first polarity, onto the electrostatic latent image in order to perform direct developing;

second developing means for depositing a second developer charged with the first polarity onto the electrostatic latent image in order to perform reverse developing;

means for selectively energizing one of said first and second developing means so as to perform the selected developing;

first biasing means for establishing a first biased voltage between said first developing means and the image carrier

to perform the direct developing by said first developing means;

second biasing means for establishing a second biased voltage, different from the first biased voltage, between said second developing means and the image carrier to perform the reverse developing by said second developing means; and

means for transferring the developer image formed on the image carrier by one of said first and second developing means onto a paper, said transferring means applying an electric discharge having a polarity of the first or second polarity respectively according to said energized first or second developing means, whereby the paper comes into contact with the surface of the image carrier.

4,678,315

IMAGE FORMING APPARATUS

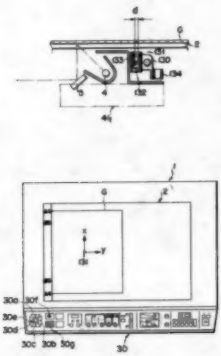
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 25, 1985, Ser. No. 791,459

Claims priority, application Japan, Oct. 27, 1984, 59-226158; Oct. 29, 1984, 59-227420

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—7 **15 Claims**



1. An image forming apparatus, wherein an original is scanned, a photosensitive body which is uniformly precharged is exposed with light to form a charge pattern corresponding to an image of the original, and the charge pattern is developed to form a developed image, the apparatus comprising:

an original table on which an original is placed;

scanning means for scanning an original placed on said original table in a prescribed scanning direction;

indicator means including a spotlight source for indicating a specific position or range on a surface of the original placed on said original table by moving a spotlight from said spotlight source along a surface of the original table;

supporting means which is movable along said original table in the scanning direction for supporting said scanning means in a fixed manner in a direction normal to the scanning direction and for movably supporting said indicator means in the direction normal to the scanning direction;

driving means for driving said supporting means and said indicator means; and

erase means for erasing charges on the photosensitive body corresponding to the specific position or the range of said original indicated by said indicator means.

4,678,316

IMAGE FORMING APPARATUS ADAPTED TO ENTER AN INTERRUPT COPYING MODE AND AN ENERGY SAVING MODE

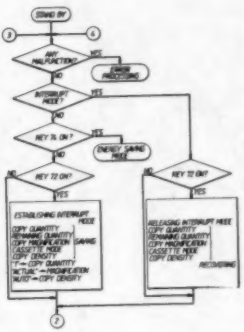
Yasuo Abuyama, Ebina, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 679,078, Dec. 6, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 873,851

Claims priority, application Japan, Dec. 20, 1983, 58-238808

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 C **2 Claims**



1. An image forming apparatus adapted to enter an interrupt copying mode and an energy saving mode comprising:

operator controlled means for applying the interrupt mode so as to interrupt a first copy run and execute a second copy run to be performed;

means for storing a copying condition data related to at least one of the first and second copy run;

means, responsive to the nterrupt mode, for setting the copying condition data related to the second copy run in exchange for the first copy run into said storing means;

means for forming an image on a recording medium in accordance with the copying condition data stored in said storing means;

means for supplying a first level of electric power being sufficient to energize said image forming means for image forming operation;

operator controlled means for establishing and terminating the energy saving mode wherein the electric power supplied to said image forming means is reduced to a second level lower than the first level so that less electric power is consumed than that for said image forming operation;

control means, responsive to said establishing and terminating means and controllingly connected to said storing means, for causing said storing means to store a predetermined copying condition data regardless of the first and second copy run in said storing means; and

means for inhibiting the establishing of the energy saving mode during the interrupt mode set by said applying means so as to prevent said control means from setting the predetermined copying condition data in said storing means.

4,678,317

CHARGE AND BIAS CONTROL SYSTEM FOR ELECTROPHOTOGRAPHIC COPIER

Israel Grossinger, Rehovot, Israel, assignor to Savin Corporation, Stamford, Conn.

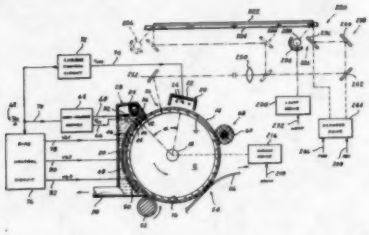
Filed Nov. 4, 1985, Ser. No. 794,765

Int. Cl.[4] G03G *15/10*

U.S. Cl. 355—14 D **12 Claims**

1. Apparatus including in combination a photoconductor having a surface adapted to bear an electrostatic charge, means

for electrostatically charging said surface of said photoconductor, means for exposing a portion of said charged surface to a pattern of light and shade to form an electrostatic latent image while leaving a portion of said charged surface unexposed, means including a developing electrode for developing said latent image, means for biasing said developing electrode, means for moving said photoconductor along a path successively past said charging means, said exposing means, and said developing electrode, means disposed along said path between



said exposing means and said developing electrode for sensing the potential of said charged surface, first means for sampling said sensing means during the movement of said unexposed portion of said charged surface past said sensing means, means responsive to said first sampling means for controlling said charging means, second means for sampling said sensing means during the movement of said exposed portion of said surface past said sensing means, and means responsive to said second sampling means for controlling the said biasing means.

4,678,318

IMAGE FORMING APPARATUS

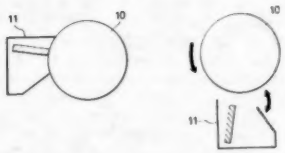
Takashi Bisaiji, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 785,066

Claims priority, application Japan, Oct. 5, 1984, 59-150191[U]

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 **4 Claims**



1. An image forming apparatus comprising:

a housing;

a latent image carrier removably disposed in said housing;

a cleaning unit removably disposed in said housing and having a cleaning blade held against said latent image carrier through a cleaning slot;

means for coupling said latent image carrier and said cleaning unit in said housing such that said coupled unit may be removed from said housing;

and wherein said cleaning unit further comprises means to angularly direct said cleaning slot upwardly when removed from said housing.

4,678,319

MEASURING DEVICE FOR SELECTING THE FILTER IN PHOTOGRAPHIC ENLARGING OR COPYING APPARATUSES

Walther Reiterer, Vilpian, Italy, assignor to Durst Phototechnik GmbH, Bozen, Italy

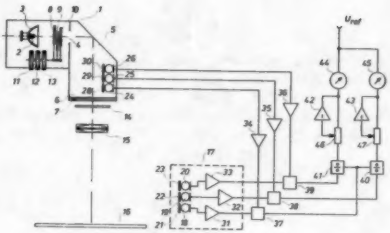
PCT No. PCT/EP85/00274, § 371 Date Feb. 24, 1986, § 102(e) Date Feb. 24, 1986, PCT Pub. No. WO86/00149, PCT Pub. Date Jan. 3, 1986

PCT Filed Jun. 7, 1985, Ser. No. 840,568

Claims priority, application Italy, Jun. 14, 1984, 4837 A/84

Int. Cl.[4] G03B *27/80*

U.S. Cl. 355—38 **5 Claims**



1. A measuring device for selecting the color composition of the copying light when copying a film frame original in a photographic enlarging or copying apparatus, said measuring device comprising in combination:

a. a first group of measuring cell means for selectively measuring the copying light intensity in the basic colors red, green and blue before said copying light passes through the film frame original, and providing a first set of red, green and blue measuring signals determined by the intensity of the colors red, green and blue, respectively, detected by said first group of measuring cell means;

b. a second group of measuring cell means for selectively measuring the copying light intensity in the basic colors red, green and blue after said copying light passes through the film frame original, and providing a second set of red, green and blue measuring signals determined by the intensity of the colors red, green and blue, respectively, detected by said second group of measuring cells;

c. operating means coupled to said first and second groups of measuring cell means and responsive to said first and second groups of measuring signals for providing a set of red, green and blue result signals, the red result signal being a combined function of the first red measuring signal and the second red measuring signal, the green result signal being a combined function of the first green measuring signal and the second green measuring signal, and the blue result being a combined function of the first blue measuring signal and the second blue measuring signal;

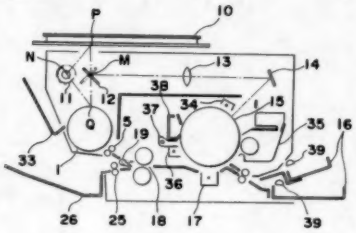
d. ratio means coupled to said operating means and responsive to the red, green and blue result signals for forming ratio signals corresponding to the ratios of the red, green and blue result signals with respect to one another; and

e. comparing means coupled to said ratio means and responsive to the ratio signals for comparing the ratio signals with preset reference values obtained from a reference original and indicating any deviation therefrom.

4,678,320
COPYING MACHINE

Yoshihal Fujii, Sakurai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 4, 1986, Ser. No. 870,385
Claims priority, application Japan, Jun. 6, 1985, 60-123995; Jun. 6, 1985, 60-123996
Int. Cl.[4] G03B 27/48, 27/50, 27/70
U.S. Cl. 355—49 3 Claims



1. A copying machine comprising an original platform on which an original is placed, an original cylinder around which an original is wound, a photosensitive body on which an image of the original is formed and an optical device, said optical device comprising:

a source of light rotatably mounted in said copying machine for applying light therefrom to either of an exposure position set on said original platform or on said original cylinder;

a reflecting mirror rotatably mounted in said copying machine for further reflecting reflected light at said respective exposure positions;

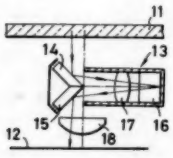
a copying lens for refracting the reflected light from said reflecting mirror towards said photosensitive body; and

means for synchronously rotating said source of light and said reflecting mirror, wherein the reflected light at either exposure position on said original platform or on said original cylinder is further reflected by said reflecting mirror onto the optical axis of said copying lens and refracted light therethrough is directed towards said photosensitive body to form the image of the original thereon in the copying operation.

4,678,321
ANAMORPHIC FOCUSING SYSTEM

Toshiyuki Inokuchi, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,788
Claims priority, application Japan, Feb. 1, 1985, 60-018404
Int. Cl.[4] G03B 27/68
U.S. Cl. 355—52 6 Claims



1. An anamorphic focusing system comprising:

a focusing device including a roof-mirror-lens array for focusing an image of an object;

a cylindrical lens disposed in an optical path extending from said focusing device toward the image for magnifying the image in a direction perpendicular to the longitudinal direction of said roof-mirror-lens array; and

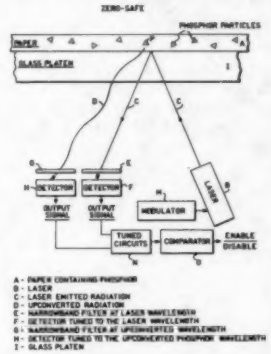
a transparent plate for compensating the length of the optical path;

wherein said cylindrical lens is movable into and out of said optical path and said transparent plate is movable into said optical path when said cylindrical lens is moved out of said optical path.

4,678,322
METHOD AND APPARATUS FOR THE PREVENTION OF UNAUTHORIZED COPYING OF DOCUMENTS

Joel R. Finkel, Woodland Hills; Paul F. Jacobs, La Crescenta; Kenneth I. Gustafson, Glendora, and William D. Green, Sunland, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 30, 1986, Ser. No. 868,983
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—133 6 Claims



1. A method of prohibiting the copying of special documents on an office copier or the like comprising:

directing a beam of light toward a document placed on said copier for copying,

first detecting the presence of said light as reflected from said document,

second detecting the presence of light as emitted by said document, and

disabling the operation of said office copier upon the detection of the presence of both of said reflected light and said emitted light.

4,678,323
DISTANCE MEASURING DEVICES AND LIGHT INTEGRATORS THEREFOR

Yuichi Sato, Tokyo; Tokuichi Tsunekawa, Yokohama, and Takashi Kawabata, Kamakura, all of Japan, assignors to Canon Kabushiki Kaisha

Filed Jul. 19, 1985, Ser. No. 757,137
Claims priority, application Japan, Jul. 20, 1984, 59-150647; Jul. 23, 1984, 59-152358; Jul. 31, 1984, 59-161050
Int. Cl.[4] G01C 3/08; G03B 3/00
U.S. Cl. 365—4 56 Claims

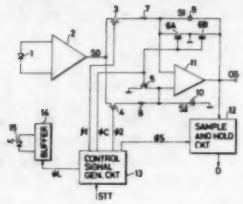
1. A synchronous integrating device, comprising:

projecting means for projecting a given intensity of light on an object during projection periods and reducing the intensity during space periods which occur at other times outside the projection periods;

sensing means for sensing ambient and projected light from the object during projection periods and space periods;

processing means responsive to said sensing means for producing space signals during the space periods and projection signals during projection periods, and for integrating

a plurality of the projection signals and a plurality of the space signals; and



timing means connected to said processing means and said projecting means for selecting the timing of projecting periods and space periods.

4,678,324

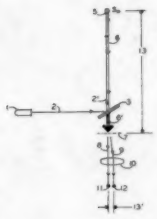
RANGE FINDING BY DIFFRACTION

Thomas De Witt, Box 83, Ancramdale, N.Y. 12503

Filed Dec. 4, 1985, Ser. No. 804,590

Int. Cl.[4] G01C *3/00;* G01B *11/02*

U.S. Cl. 356—45 **7 Claims**



1. A method for determining range by correlating the relationship between the distances of a diffraction grating from an illuminated target surface with the respective relative displacements of high order diffraction images from the position of the respective zero order image as observed through said grating.

4,678,325

APPARATUS FOR MEASURING OPTICAL PROPERTIES OF PAPER

Olavi Lehtikoski, Sölvenkatu 8, SF-78300 Varkaus 30, and Martti Nissinen, SF-78880 Kuvansi, both of Finland

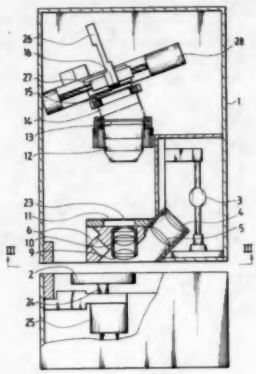
Filed Apr. 24, 1984, Ser. No. 603,512

Claims priority, application Finland, May 5, 1983, 831543

Int. Cl.[4] G01J *3/32;* G01N *21/86*

U.S. Cl. 356—73 **12 Claims**

1. An apparatus for measuring optical properties of paper, said apparatus comprising a housing, a background screen for supporting a paper sample, and, inside said housing, a light source, lenses for focusing the light from said light source on the background screen, a plurality of first detectors for measuring the intensities of light reflected off paper on said screen and of light penetrating said paper, an assembly for processing scattered light, and a second detector for measuring the intensity of scattered light, characterized in that said background screen is movable relative to said housing and is provided with elements for measuring optical properties and calibrating the apparatus, and said assembly for processing scattered light comprises a grid and a pair of limiters positioned between said second detector and said grid in immediate proximity of said second detector, whereby said grid projects a sprectrum along a focal plane, said limiters comprising in conjunction with said grid a bandpass filter and being movable together with said detector within the range of a spectrum, along a curved path determined by the focal plane, said second detector being



adapted to measure step by step the intensity of sections of desired width of the spectrum of light along the focal plane.

4,678,326

APPARATUS FOR THE MEASUREMENT OF FLUORESCENCE, TURBIDITY, LUMINESCENCE OR ABSORPTION

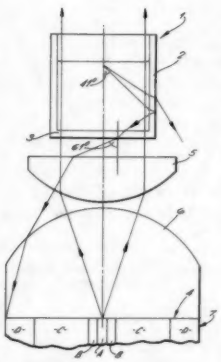
Hannu Harjunmaa, Espoo, Finland, assignor to Labsystems Oy, Helsinki, Finland

Filed May 17, 1984, Ser. No. 611,132

Claims priority, application Finland, May 30, 1983, 831936

Int. Cl.[4] G01N *21/49, 21/64, 21/59*

U.S. Cl. 356—73 **7 Claims**



1. In an apparatus for measuring optical properties such as fluorescence, luminescence, turbidity and absorption of a liquid sample contained in a cylindrical cuvette having a central optical axis, the apparatus including a light source and at least one light sensor, the apparatus further comprising collimating means disposed adjacent said cuvette, the collimating means having an optical axis in alignment with both the central optical axis of the cuvette and a central optical axis of a fiber bundle, said fiber bundle having an end portion located adjacent to said collimating means and defining a plurality of independent light transmitting paths, said light transmitting paths extending along the length of said fiber bundle to its end portions, wherein said fiber bundle and collimating means transmit collimated light to said sample and selectively collect light

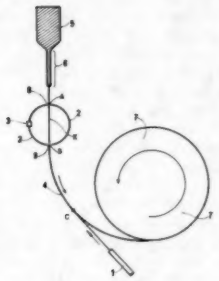
emanating therefrom, said collimating means having at least one lens means to focus light emanating from said sample upon the end portion of said fiber bundle adjacent thereto whereby a substantially equal proportion of light from a volume element of said sample is transmitted to said fiber bundle by way of said collimating means.

4,678,327

METHOD FOR INSPECTING AN OPTICAL FIBER

Noriyuki Yoshida, and Kenichi Takahashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 12, 1985, Ser. No. 797,015
Claims priority, application Japan, Dec. 24, 1984, 59-279335
Int. Cl.[4] G01N *21/89*
U.S. Cl. 356—73.1 **13 Claims**



1. A method for inspecting an optical fiber during fabrication, comprising the steps of:

drawing said optical fiber from a fiber fabrication apparatus to a winding device through an integration sphere having an inlet opening, an outlet opening, an inner diffuse reflection surface, and a photodetector;

shooting from a light source a strong beam of light obliquely at a side surface of said optical fiber such that a portion of the light beam penetrates into the fiber core and is scattered by defects in said core so as to form an inspecting light which propagates in said fiber core;

measuring the light power detected by said photodetector within said integration sphere; and

determining the position of a defect in said optical fiber by estimating the amount of change of output power of said photodetector as a function of time.

4,678,328

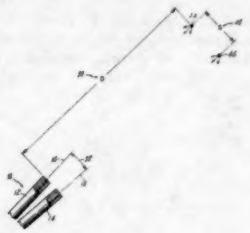
NON-OPTIMUM WAVEGUIDE OPTICAL SENSOR

Preston S. Craig, and William F. Arendale, both of Huntsville, Ala., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 17, 1986, Ser. No. 853,245
Int. Cl.[4] G01B *11/26*; G01C *3/00*; H01J *5/16*
U.S. Cl. 356—141 **6 Claims**

1. A non-optimum waveguide optical sensor for measuring the separation between first and second optical sources emitting first and second optical signals, comprising:

optical guiding means for selectively receiving the optical signals including first and second non-optimum optical waveguides each disposed along an optic axis and each having an inner core guide means and an outer cladding means, said core guide means refractive index selected to be less than or equal to said cladding means refractive index, said first and second non-optimum optical waveguides positioned so as to form a known angle therebetween; and



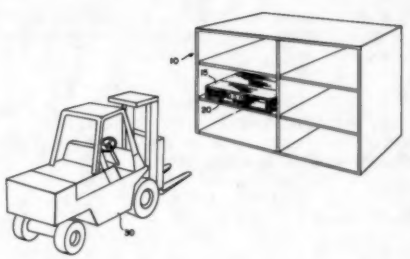
detector means positioned with respect to said optical guiding means so as to receive the optical signals therefrom and for providing electrical signal equivalents thereof.

4,678,329

AUTOMATICALLY GUIDED VEHICLE CONTROL SYSTEM

Frank J. Lukowski, Jr., Alden, and Harry B. Hammill, III, Williamsville, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,280
Int. Cl.[4] G01B *11/26*
U.S. Cl. 356—152 **5 Claims**



1. Apparatus for use in determining the relative location of a vehicle with respect to a target, including:

a light source and a camera mounted on the vehicle, said target including at least three reflector elements, each selected to form an image of the light source, and all the images together defining a plane oriented other than normal to a line from the light source to the target;

means for recording those images due to ambient light formed on the image plane of said camera;

means for thereafter flashing the light source;

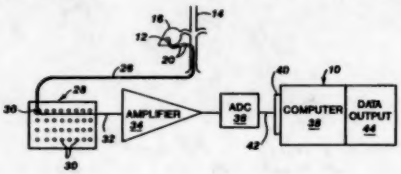
means for comparing said images due to ambient light stored in said recording means and the images resulting both from ambient light and from the light source; and

means for recording those images formed on the image plane of said camera due only to reflections of said light source.

4,678,330
METHOD AND APPARATUS FOR MEASURING SOLAR RADIATION IN A VEGETATIVE CANOPY

Vincent P. Gutschick; Michael H. Barron; David A. Waechter, and Michael A. Wolf, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 30, 1985, Ser. No. 729,022
Int. Cl.[4] G01J 1/42
U.S. Cl. 356—222 **13 Claims**



1. An apparatus for measuring solar radiation received in a vegetative canopy, said apparatus comprising:

a. a multiplicity of sensors for selectively generating an electrical signal in response to impinging photosynthetically active radiation in sunlight, each of said sensors being insensitive to infrared radiation and being attached to an upper surface of a plant within the vegetative canopy, each of said sensors being sufficiently lightweight to permit substantially normal plant movement;

b. a junction box having a multiplicity of ports, each of said sensors being electrically connected to a different one of said ports;

c. a multiplicity of operational amplifiers for amplifying the electrical signals generated by said sensors, each of said ports being electrically connected to a different one of said operational amplifiers;

d. a multplicity of analog-to-digital convertors for digitizing the electrical signals, each of said analog-to-digital convertors being electrically connected to a different one of said operational amplifiers;

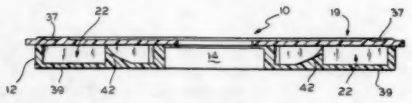
e. a computer operatively connected to said analog-to-digital convertors for accumulating and storing solar radiation data; and

f. data output means for displaying the solar radiation data, said data output means being operatively connected to said computer.

4,678,331
MULTICUVETTE ROTOR ASSEMBLY

Matthew J. Perry, Libertyville, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 21, 1984, Ser. No. 623,057
Int. Cl.[4] G01N 21/07
U.S. Cl. 356—246 **3 Claims**



1. A multicuvette rotor for use in a centrifugal chemistry analyzer comprising:

a substantially circular body member having a substantially planar upper surface, a lower surface, and a plurality of spaced apart recesses extending radially in the peripheral portion thereof;

a substantially circular cover member disposed adjacent the planar upper surface of said body member such that a plurality of enclosed chambers are defined by said cover member and said recesses;

said cover member having an upper surface, a substantially planar lower surface, and a plurality of apertures through said cover member for filling the chambers with fluid; each of said enclosed chambers having a top wall defined by said cover member, a bottom surface defined by said body member, an inner end wall disposed toward the center of said body member, an outer end wall disposed at the periphery of said body member, sidewalls extending radially between said inner and outer end walls, and a barrier member disposed between said end walls and sidewalls;

said barrier member having an upstanding wall portion defining an inner chamber disposed toward the central portion of said body member, and an outer chamber disposed toward the peripheral portion of said body member;

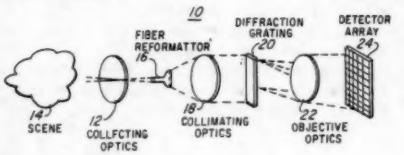
said apertures positioned in said cover member so that said inner and outer chambers may be independently filled with fluid;

said barrier member further comprising an inclined ramp surface having a lower edge portion disposed adjacent the bottom surface of said inner chamber, lateral edge portions disposed adjacent the radially extending chamber sidewalls, an upper edge portion defining the intersection between the upstanding wall portion and inclined ramp surface, and a fluid transfer passage defined by the top of said upstanding wall portion and the lower surface of said cover member, and wherein the ramp surface extends inwardly from each of the lateral edge portions to a first and second vertically depending inner sidewall respectively, said inner sidewall extending from the lateral edge ramp surface downwardly to an interior ramp surface extending between said inner sidewalls; and wherein the lateral edges of said upstanding wall portion disposed adjacent the radially extending chamber sidewalls extend from the bottom surface of said chamber to an area substantially adjacent the lower surface of said cover member.

4,678,332
BROADBAND SPECTROMETER WITH FIBER OPTIC REFORMATTOR

Dan Rock, 909 Torrance; Mark Roth, 1518 Burgundy St., both of Garland, Tex. 75040, and Stephen F. Sagan, 4633 Ringgold La., Plano, Tex. 75075

Filed Feb. 21, 1984, Ser. No. 581,950
Int. Cl.[4] G01J 3/18
U.S. Cl. 356—328 **17 Claims**



1. A broadband spectrometer apparatus for field use comprising:

(a) a spectrometer means for dispersing radiation into its component wavelengths including: a collecting optics having a first numerical aperture for collecting electromagnetic energy and for focusing the collected electromagnetic energy according to the first numerical aperture, a fiber optics reformattor having a plurality of fibers arranged to form a front face forming a field stop for receiving the focused electromagnetic energy and a back face forming an entrance slit for the spectrometer means, and each single fiber optic of the plurality of fiber optics at the back face has a second numerical aperture having a mathematical relation to the first numerical aperture such that a value for the second numerical aperture is larger than the value of the first numerical aperture, the fiber optics reformattor being for reformatting the received and focused

electromagnetic energy and a means for dispersing the focused and reformatted electromagnetic energy into component wavelengths; and

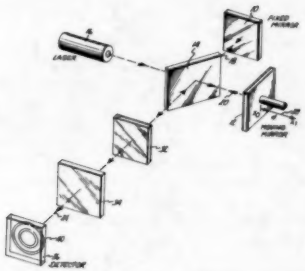
(b) detector means operatively connected to the spectrometer means for detecting the reformatted, received, dispersed and focused electromagnetic energy to obtain the dispersed radiation component wavelength thereby.

4,678,333

DOUBLE-PASS OPTICAL INTERFEROMETER

Charles R. Anderson, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed May 10, 1985, Ser. No. 732,603
Int. Cl.[4] G01J *3/45*; G01B *9/02*
U.S. Cl. 356—346 **6 Claims**



1. Apparatus for double passing an output beam of radiation through a Michelson-type interferometer, comprising:

beam splitter means for reflecting a first portion of the output beam of radiation back into the interferometer, and for propagating a second portion of the output beam of radiation; and

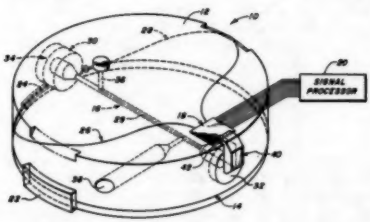
bandpass filter means for filtering from the propagated second portion of the output beam of radiation a portion which has been twice passed through the interferometer.

4,678,334

SPLICELESS OPTICAL FIBER RESONANT RING LASER GYROSCOPIC SYSTEM

Godfrey T. Coate, Belmont, and Joseph D. Coccoli, Sudbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed May 20, 1983, Ser. No. 496,579
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Int. Cl.[4] G01C *19/64*; G01B *9/02*
U.S. Cl. 356—350 **8 Claims**



1. A spliceless optical-fiber resonant-ring laser gyroscopic system, comprising:

a housing having an ultra-low coefficient of thermal expansion;

a selected length of optical-fiber mounted by coiling to said housing to provide an optical-fiber ring having at least one turn, the axis of the ring defining a rotation sensing direction;

an evanescent-wave directional coupler provided along a localized common contiguous region proximate the ends of said optical-fiber to provide a spliceless optical-fiber ring;

first means connected to said housing aand coupled to the ends of the optical-fiber for selectively exciting the spliceless optical-fiber ring alternately in a clockwise and in a counterclockwise resonant mode; and

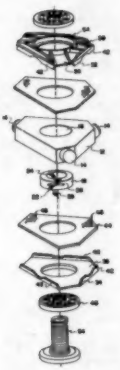
second means coupled to said spliceless optical-fiber resonant-ring and operative in response to said clockwise and counterclockwise resonant modes for providing a signal indication of the rate of angular rotation of said housing about the sensing direction.

4,678,335

RING LASER GYRO BLOCK STIFFENER

Ralph T. Berg, Ham Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 20, 1984, Ser. No. 642,616
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **5 Claims**



1. A laser motion sensing device, comprising in combination:

a block with a passage formed therein defining a lasing path;

a cavity in said block with its longitudinal axis oriented generally perpendicular to the lasing path; and

a radially expandable ring shaped member in said cavity and engaging the walls of said cavity, said ring member including means for rigidly expanding said ring against said cavity walls with substantially zero axial deflection.

4,678,336

APPARATUS FOR DETECTING IMAGE AREA OF THIN PLATE

Teruo Tsunoda, Chiba, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 656,158
Int. Cl.[4] G01B *11/28*
U.S. Cl. 356—380 **4 Claims**

1. An apparatus for detecting an image area of a thin plate comprising:

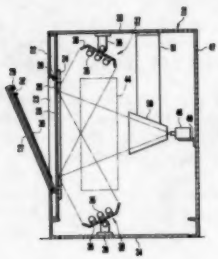
a housing having a vertical side plate at one side thereof, said vertical side plate having an opening;

a door movable to close/open said opening;

a holder for removably mounting the thin plate such that

when said door is closed said plate covers at least a portion of said opening;

photographic means mounted inside said housing so as to oppose said vertical side plate; and



illumination means mounted on inner surfaces of upper and lower plates and side plates of said housing, each of said illumination means having three fluorescent lamps and being perpendicular to said vertical side plate in such a manner that illumination directions of said illumination means are directed toward said thin plate.

4,678,337

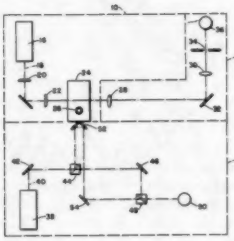
LASER BASED GAGING SYSTEM AND METHOD OF USING SAME

David A. Cohen, and David M. Papurt, both of Cambridge, Mass., assignors to Laser Metric Systems, Inc., Cambridge, Mass.

Filed May 3, 1985, Ser. No. 730,200

Int. Cl.[4] G01B *11/02*

U.S. Cl. 356—387 **25 Claims**



1. A method of measuring, comprising the steps of:

providing a laser beam;

moving an object to be measured through the beam;

imaging onto a first plane a light pattern formed in a second plane , said light pattern including a diffraction pattern caused by interaction of the beam and the object, said second plane being adjacent the plane perpendicular to the beam that is first entered by the object;

sampling the intensity of the light pattern in the first plane over a fraction of its extent said fraction being sufficiently small to enable resolution of the diffraction pattern;

measuring the distance traveled by the object while the intensity is below a threshold value; and

calculating the dimension of the object in the direction of movement of the object from the distance traveled by the object.

4,678,338

COLOR SENSOR

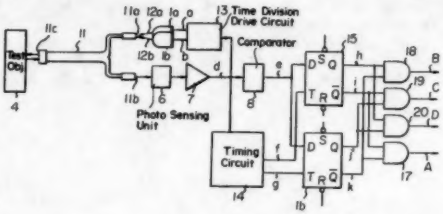
Kenichi Kitta, Tokyo; Yasunori Kanazawa, Hachioji, and Yoshiro Otomo, Mitaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Nov. 22, 1983, Ser. No. 554,363

Claims priority, application Japan, Nov. 22, 1982, 57-203762; Nov. 22, 1982, 57-203763; Nov. 27, 1982, 57-206856; Nov. 27, 1982, 57-206857

Int. Cl.[4] G01J *3/50*

U.S. Cl. 356—402 **10 Claims**



1. A color sensor for recognizing the relative color of an object comprising:

first illumination means for supplying light of a first wavelength to said object;

second illumination means for supplying light of a second wavelength different from said first wavelength to said object;

means for monitoring said light of said first and second wavelengths from said object, and means for monitoring including,

a single photosensor producing an output indicative of the quantity of light received from said object, and

comparator means for comparing the output of said single photosensor to a reference value, the output of said comparator being a logical one when light supplied said photosensor exceeds said reference value and being otherwise a logical zero;

timing control means for generating first and second alternate enable signals to enable said first and second illumination means, alternately; and

hue determination means, operatively connected to said timing control means, for retaining the logical values developed by said comparator means, said hue determination means receiving first and second phase shifted latch timing signals developed by said timing control means to reset said hue determination means, said hue determination means developing at least three logical outputs, each representative of the presence or absence of a different color of said object.

4,678,339

SCREW EXTRUDER

Herbert Peiffer, Mainz, and Horst Eberhardt, Walluf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 765,720

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430254

Int. Cl.[4] B29F *3/01, 3/02*

U.S. Cl. 366—76 **25 Claims**

1. A screw extruder, comprising:

a barrel;

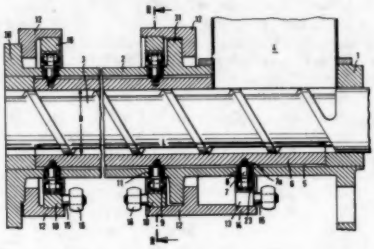
means defining a material intake in said barrel;

an extruder screw positioned in said barrel;

a feed bush, coaxially surrounding said extruder screw, having an inner circumference and a side opposite said material intake, and being positioned about the material intake;

means defining a plurality of longitudinally extending

grooves circumferentially positioned about the inner circumference of said bush and having a predetermined depth;



an adapter positioned in each of said plurality of grooves; and

adjustment means for radially adjusting said adapters relative to said extruder screw over the depth of said grooves.

4,678,340

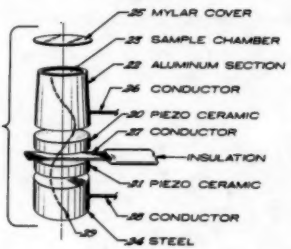
SAMPLE HOLDER FOR POWDER X-RAY DIFFRACTOMETER

Roland Boese, Essen, Fed. Rep. of Germany, assignor to Nicolet Instrument Corporation, Madison, Wis.

Continuation of Ser. No. 655,330, Sep. 27, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,964

Int. Cl.[4] B01F *11/02*

U.S. Cl. 366—111 **11 Claims**



1. An x-ray powder diffractometer comprising:

x-ray source means;

x-ray detector means; and

sample holder means for positioning a sample to be analyzed intermediate said source means and detector means, said sample holder means comprising sample chamber means for accepting a sample to be analyzed and ultrasonic generator means operatively connected to said sample chamber means for inducing ultrasonic vibration within a sample within said sample chamber means.

4,678,341

INTEGRATED LIQUID DISTRIBUTION APPARATUS

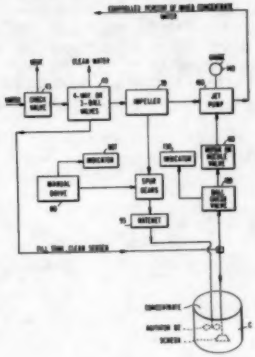
William C. Stuckey, 1503 Virginia St., East, Charleston, W. Va. 25311

Filed May 16, 1985, Ser. No. 734,732

Int. Cl.[4] B01F *15/00*

U.S. Cl. 366—142 **25 Claims**

1. In a water operated dispersion system in which water under pressure drives a rotor coupled to an agitator immersed in a constituent to be mixed and dispersed with the water, and water from said rotor operates a jet pump having a suction passage for suctioning said constituent from a container there-



for, the improvement comprising, means for indicating to the user operation of said agitator means.

4,678,342

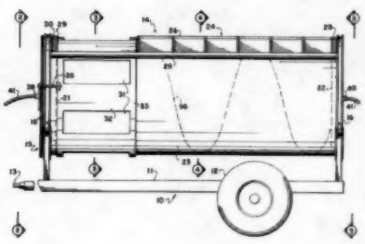
DRUM FOR MIXING AND DISPENSING FEED MATERIAL

Austin L. Dalman, Box 261, Baldur, Manitoba, Canada R0K 0B0

Filed Aug. 26, 1985, Ser. No. 769,426

Int. Cl.[4] B01F *9/04, 15/02*

U.S. Cl. 366—186 **18 Claims**



1. Apparatus for mixing and dispensing material comprising a cylindrical drum having end walls and a cylindrical peripheral wall for receiving and containing the material, means mounting the drum for rotation about a substantially horizontal axis arranged longitudinally of the drum, an inlet opening in the drum through which said material can be introduced into the drum, means for preventing escape of said material from said drum through said inlet opening during said rotation thereof for mixing said material, a plurality of separate outlet opening means in said peripheral wall at an axially aligned position, each extending angularly around the wall and each in angularly spaced relation to an adjacent opening whereby rotation of said drum causes said material to be deposited from said drum by gravity at said axially aligned position, cover means mounted on said drum for corotation therwith and movable relative thereto from a first position for closing said outlet opening means to a second position in which all of said opening means are opened and conveyer means for collecting said deposited material and conveying it from the drum for dispensing.

4,678,343

DEVICE FOR ATTACHING SOLES DIRECTLY TO UPPERS

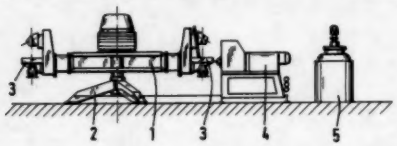
Klaus Pontius, Hermeskeil; Manfred Settinger, Osburg, and Lothar Oster, Achim-Uesen, all of Fed. Rep. of Germany, assignors to Klöckner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 858,923

Claims priority, application Fed. Rep. of Germany, May 7, 1985, 3516311

Int. Cl.[4] B29B *1/10*

U.S. Cl. 366—349 17 Claims



1. A jet-molding unit device adapted for use in attaching soles directly to uppers, the device comprising a mixing head with a worm gear therein, the worm gear having an axis and being in a gear mounting, a magazine adapted to retain a plurality of worm gears, and an automatic gripping means for gripping the worm gear in the gear mounting at a point removed from the mixing head, removing the worm gear from the gear mounting and depositing the worm gear in the magazine, and removing a second worm gear from the magazine and inserting it into the worm gear mounting.

4,678,344

ELECTRONIC TIMEPIECE

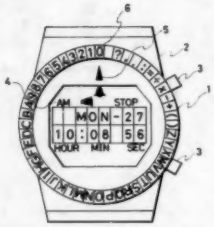
Yuichi Inoue, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

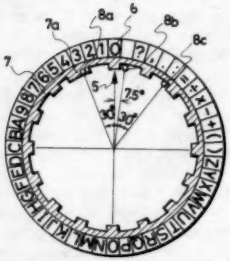
Filed Feb. 13, 1986, Ser. No. 829,391

Claims priority, application Japan, Feb. 14, 1985, 60-26881

Int. Cl.[4] G04C *17/00*

U.S. Cl. 368—69 2 Claims





1. An electronic timepiece having a rotary annular dial rotatable in a clickwise manner on a timepiece case, comprising:

an electric pattern disposed on said rotary annular dial and having a toothlike contact portion;

three switch pins coacting with said contact portion to define three switch circuits for producing electric signals when the switch pins make electrical contact with said contact portion; and

switch input circuit means responsive to electric signals from said switch circuits for identifying the rotary position of said rotary annular dial, the switch input circuit means having first memory means for memorizing present switch data representative of the present switching state of said switch circuits, second memory means for memorizing prior switch data representative of a prior switching state of said switch circuits, output means connected to said first memory means and said second memory means for generating a signal representative of the rotation direction and the rotation amount of said rotary annular dial, and third memory means connected to receive said signal for memorizing the present postion of said rotary annular dial;

said switch pins and said contact portion being configured and arranged such that when any one of said pins makes electrical contact with said contact portion, the other two pins do not make electrical contact with said contact portion, and when said annular dial is rotated for one click, said pin which was making contact with said contact portion no longer makes contact with said contact portion and one of said two pins which were not making contact with said contact portion does make contact with said contact portion, the pin making contact with said contact portion being determined according to the rotation direction of said annular dial.

4,678,345

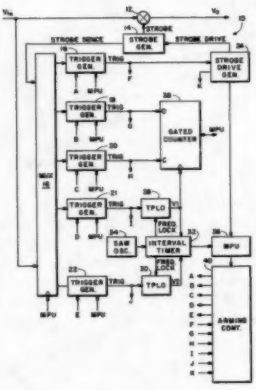
EQUIVALENT TIME PSEUDORANDOM SAMPLING SYSTEM

Agoston Agoston, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 1, 1986, Ser. No. 858,424

Int. Cl.[4] G04F *8/00*; G03K *21/32*

U.S. Cl. 368—119 13 Claims



1. A method for measuring a time interval between first and second events comprising the steps of:

periodically generating a reference signal;

triggering first and second periodic signals on occurrence of said first and second events, respectively;

sampling said first and second periodic signals on each occurrence of said reference signal and determining the magnitude of each signal sample;

counting cycles of said first periodic signal occurring after

triggering said first periodic signal and before the sampled magnitude of said first periodic signal crosses a predetermined level, thereby producing a first count;

counting cycles of said second periodic signal occurring after triggering said second periodic signal and before the sampled magnitude of said second periodic signal crosses said predetermined level, thereby producing a second count; and

counting occurrences of said reference signal generated between a first moment when said sampled magnitude of said first periodic signal crosses said predetermined level and a second moment when said sampled magnitude of said second periodic signal crosses said predetermined level, thereby producing a third count.

4,678,346

STEPPING MOTOR FOR A CLOCK

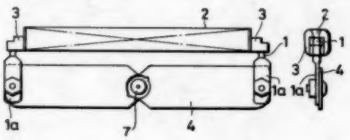
Shigeru Shimozono, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,822

Claims priority, application Japan, Jun. 20, 1985, 60-134921

Int. Cl.[4] G04F *5/00;* **G06F** *1/04*

U.S. Cl. 368—157 **19 Claims**



1. In a clock having a core, a stator having a pair of magnetic poles and magnetically connected to both ends of the core, a coil wound around the core, a rotor rotatably disposed between the magnetic poles of the stator, means for producing driving pulses of a predetermined cycle supplied to the coil to rotate the rotor, and means for displaying time on the basis of the rotation of the rotor, the improvement comprising: said core having an effective length L along which the coil is wound, said coil having a thickness R between the center of the core and the outermost periphery of the coil, the length L of the core and the thickness R of the coil satisfying the relation $10 \leqq L/R \leqq 40$, said rotor having a radius r_o in the range 1 mm $\leqq r_o \leqq$ 2 mm, and the driving pulses having a pulse width t in the range 9 mS $\leqq t \leqq$ 17 mS.

4,678,347

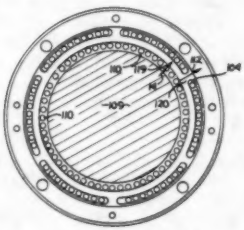
RECIRCULATING BEARING

Gary Butts, Huntington Beach; Lukas Sydo, Orange, and Victor L. Rossi, LaHabra, all of Calif., assignors to Ling Electronics Inc., Anaheim, Calif.

Filed May 5, 1986, Ser. No. 859,611

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—43 **24 Claims**



2. A bearing for supporting a shaft and capable of accommodating linear or rotary motion of said shaft or both such motions, comprising:

a housing having a central opening including an inner wall surrounding a portion of said shaft and defining a space between said inner wall and said shaft such that said shaft is free to move;

a plurality of ball bearings disposed in the space between said inner wall and said shaft, said ball bearings being arranged in a closely adjacent relationship to each other and free to contact each other such that said ball bearings fully surround the periphery of said shaft within the central opening of said housing;

return means including a plurality of channel openings formed as a part of said housing, said channel openings being axially coterminus with, radially outward of, and arranged in spaced-apart relationship around said central opening for recirculating said ball bearings through said channel openings such that as said shaft moves axially said ball bearings are urged to move generally in the direction of said shaft's motion, said return means directing ball bearings from one end of said housing to the other end through a channel opening, thereby recirculating them within said housing and to and from the space between said inner wall and said shaft;

whereby ball bearings continuously fully peripherally surround, and are maintained in contact with, said shaft.

4,678,348

RADIAL SPIRAL-GROOVE BEARING

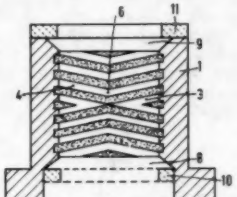
Leonardus P. M. Tielemans, Eindhoven, and Franciscus M. J. Van Roemburg, Drachten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,914

Claims priority, application Netherlands, May 17, 1985, 8501423

Int. Cl.[4] F16C *32/06, 33/10*

U.S. Cl. 384—114 **4 Claims**



1. A radial bearing comprising a circular cylindrical outer bearing member and a shaft arranged therein, said member and shaft being rotatable with respect to each other about an axis and having cooperating bearing surfaces; and a supply of lubricant arranged between said surfaces,

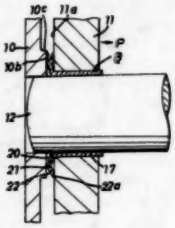
one of said surfaces having a plurality of cooperating patterns of shallow lubricant-pumping grooves arranged for building pressure in said lubricant during relative rotation, and at least two patterns in adjoining successive axial zones having opposite directions of helical angle to cause pumping in one direction of relative rotation,

characterized in that said one surface has a circumference having first and second halves, the first half having two oppositely directed patterns of grooves in each of said adjoining successive axial zones for pumping lubricant in one direction of relative rotation, and the second half having two oppositely directed patterns of grooves in each of said adjoining successive axial zones for pumping lubricant in a direction of relative rotation opposite said one direction, the patterns of grooves in one half of one zone adjoining and communicating with the patterns of grooves in the other half at diametrically opposed locations.

4,678,349
BUSH USED FOR BICYCLE BRAKE DEVICE

Toshiharu Yoshigai, Higashi-Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Kabushiki Kaisha, Osaka, Japan

Filed Dec. 30, 1985, Ser. No. 814,778
Claims priority, application Japan, Apr. 4, 1985, 60-50228[U]
Int. Cl.[4] F16C 17/10, 27/02
U.S. Cl. 384—125 4 Claims



1. A bush made of plastic for use in a bicycle brake device, comprising a cylindrical portion connected integrally with a flange which is provided at one end of the cylindrical portion and extends radially outwardly from said end generally perpendicular to a longitudinal axis of the cylindrical portion;

wherein the flange is, in a direction from the cylindrical portion to an outer edge, successively comprised of;

an annular flat portion which is directly connected with said end of the cylindrical portion and extends perpendicular to the longitudinal axis of the cylindrical portion;

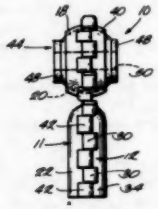
a bulged portion which is connected with the annular flat portion and bulges axially beyond said end of the cylindrical portion; and

an inclined annular portion which is connected with the bulged portion and extends, relative to said end of the cylindrical portion, in an axial direction opposite to the bulging of the bulged portion, an outer edge portion of the inclined annular portion being displaceable into alignment with a plane passing through said end of the cylindrical portion perpendicular to the longitudinal axis of the cylindrical portion.

4,678,350
BEARING ASSEMBLY

Robert G. Statz, 2478 N. 66th St., Wauwatosa, Wis. 53213

Filed Jun. 2, 1986, Ser. No. 869,256
Int. Cl.[4] F16C 23/04, 25/04
U.S. Cl. 384—208 18 Claims



1. A bearing assembly comprising

a first half including a first head portion partially defining a socket, a first shank portion connected to said first head portion, and a first periphery having extending therefrom a plurality of spaced first projections, and

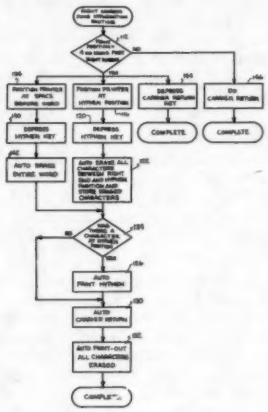
a second half substantially identical to said first half and including a second head portion aligned with said first head portion to define said socket, a second shank portion connected to said second head portion and aligned with said first shank portion, and a second periphery having extending therefrom a plurality of spaced second projections,

said first projections being folded over said second periphery and said second projections being folded over said first periphery in alternating relationship so that said first and second projections interlock said halves and align said halves with respect to each other.

4,678,351
RIGHT MARGIN ZONE HYPHENATION

Charles M. Curley, Ithaca, N.Y., assignor to SCM Corporation, Cortland, N.Y.

Filed Jun. 23, 1986, Ser. No. 877,063
Int. Cl.[4] B41J 5/30; G06F 11/00
U.S. Cl. 400—64 11 Claims



1. A right margin zone hyphenation system for use in an electronic typewriter having a keyboard with a plurality of character keys including a hyphen key and function keys including a carriage return key selectable for issuing unique signals, a platen, a carrier, a printing mechanism including a print hammer supported on the carrier for printing characters at selected print positions on printing lines on a work sheet supported on the platen, the selected print positions includes a left margin and a right margin having several print positions, a correction mechanism for erasing previously printed characters from the word sheet, bi-directional feeding means for horizontally moving the carrier relative to the platen, electronic processor means for receiving the unique signals from selected keyboard keys and for controlling functional operation of typewriter mechanisms in accordance with the signals received, a correction buffer connected to the processor means, the correction buffer including a plurality of memory registers capable of storing therein character codes and corresponding print positions representative of the last plurality of printed characters, the right margin zone hyphenation system comprising:

means responsive to depression of the carriage return key for determining if the printing mechanism is located in a predetermined hyphenation zone within the right margin;

means responsive to depression of the hyphen key for automatically erasing from the work sheet printed characters in the hyphenation zone when the printing mechanism is determined to be in the hyphenation zone; and

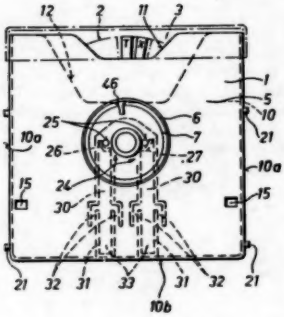
means further responsive to depression of the hyphen key for automatically printing a hyphen at a predetermined print position in the hyphenation zone.

4,678,352

RECEIVING ARRANGEMENT FOR A MULTIPLE TYPE CARRIER FOR AN IMPACT PRINTER

Arthur Kittel, Wilhelmshaven, and Heiner Gerken, Jever, both of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Division of Ser. No. 246,696, Mar. 23, 1981, Pat. No. 4,627,750, which is a continuation of Ser. No. 40,214, May 18, 1979, abandoned. This application Oct. 29, 1985, Ser. No. 792,558
Claims priority, application Fed. Rep. of Germany, May 22, 1978, 2822313
Int. Cl.[4] B41J 1/30
U.S. Cl. 400—175 3 Claims



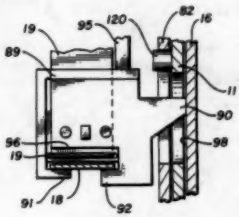
1. In a combination comprising a print wheel provided with a plurality of elastic spokes carrying print type faces, and a cassette carrying said print wheel, said cassette being provided with guide members and being insertable into, and removable from, together with said print wheel, a printer having a printing hammer mechanism arranged to act on a type face and a rotatable setting shaft to which the print wheel can be releasably fastened, and cassette holding means defining an insertion shaft extending substantially transversely to the axis of the setting shaft and arranged to cooperate with said guide members to guide said cassette during insertion into the printer, the cassette holding means including detent means composed of a pivotal control lever movable between a cassette holding position and a cassette release portion carrying a detent tongue and means for permitting removal of said cassette from the insertion shaft, the improvement wherein said cassette comprises: front and rear faces each coextensive with more than one-half of said print wheel; counterdetent means constituted by recesses in said cassette positioned to engage the detent tongue to hold said cassette in the insertion shaft in a fully inserted position in which said print wheel is fastened to the setting shaft; and control means located to act on the control lever to pivot the control lever into the cassette holding position for causing the detent tongue to engage said counterdetent means when said cassette moves into its fully inserted position, and said cassette holding means further comprise: spring means connected to said control lever for constantly urging said control lever toward its cassette release position; and manual actuation means including a handle operatively associated with said control lever and mounted for pivotal movement between a retaining position in which said control lever is held in said cassette holding position and a removal position for causing said control lever to move to its cassette release position under the action of said spring means.

4,678,353

TAPE SUPPLY CARTRIDGE

Michael M. Richardson, Scottsdale, Ariz., and Douglas A. Schaffer, Inver Grove Heights, Minn., assignors to Kroy Inc., St. Paul, Minn.

Division of Ser. No. 549,261, Nov. 4, 1983, Pat. No. 4,557,617.
This application Oct. 22, 1985, Ser. No. 790,111
Int. Cl.[4] B41J 32/00, 35/36, 35/04
U.S. Cl. 400—248 11 Claims



1. A tape supply cartridge for supplying tape to a lettering apparatus comprising:

a cartridge housing having a pair of parallel side walls connected by a peripheral edge wall;

a supply of tape within said housing;

advancement means for advancing said tape along a tape advancement path in a direction generally parallel to said side walls into letttering alignment with said apparatus; and

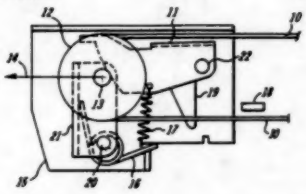
a tape guide fixedly supported within said housing and including a laterally extending tape guide element having a pair of laterally spaced tape guide tabs having tape guide edges, said tape guide adapted for limited lateral movement relative to said side walls in a direction generally perpendicular to said side walls, said tape guide further including a centering tab having a portion extending laterally outwardly past one of said side walls in a direction generally perpendicular to said one side wall for engagement with a reference surface on said apparatus, said centering tab being connected with said tape guide element such that lateral movement of said centering tab correspondingly causes said limited lateral movement of said tape guide element.

4,678,354

TYPEWRITER CABLE TENSIONING MECHANISM

Alf J. Olsen, Elk Grove Village, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 2, 1985, Ser. No. 803,686
Int. Cl.[4] B41J 19/56
U.S. Cl. 400—335 4 Claims



1. In a typewriter comprising a platen and a carriage which has a range of motion from the left end to the right end of the platen, a tensioning mechanism for maintaining a typewriter carriage cable at a predetermined tension comprising:

a pulley around which the cable is wrapped,

first means for biasing the pulley against the cable to achieve said predetermined cable tension,

a snubber preventing the pulley from moving in a direction that would result in a decreased cable tension, and

means for disengaging the snubber from the pulley when the carriage is at one end of its range of motion to allow the cable tension to be decreased if it is greater than the predetermined tension.

4,678,355

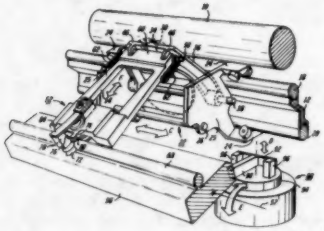
PRINT TIP CONTACT SENSOR FOR QUIET IMPACT PRINTER

Andrew Gabor, Alamo; John C. Dunfield, San Jose; George W. Bowers, Jr., Hayward, and Richard G. Crystal, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1985, Ser. No. 751,349

Int. Cl.[4] B41J *9/36, 1/30*

U.S. Cl. 400—389 **4 Claims**



1. An impact printer including a platen, selectable character elements, an impacting element movable toward and away from said platen, and means for driving said impacting element to impart a printing force to a selected character element, to drive it to deform said platen, said printer being characterized by:

said impacting element including sensor means thereon for generating a signal indicative of the initiation of said deformation, and

said means for driving comprising force applying means responsive to said signal for accelerating said impacting element to cause said deformation.

4,678,356

EXTENDABLE WRITING INSTRUMENT

Thomas N. Garland, 617 W. Kiowa Ave., Fort Morgan, Colo. 80701

Filed Jul. 3, 1985, Ser. No. 751,690

Int. Cl.[4] B43K *23/00*

U.S. Cl. 401—95 **11 Claims**

1. In an extendable writing implement, the combination comprising:

a tubular housing having an inner surface, an outer surface, and first and second ends, a cylindrical writing element insertable within said housing having an operative end extendable through said first end of said housing, a support end releasably retainable in said second end of said housing and axially spaced external shoulders between said operative end and said support end;

releasable retaining means disposed adjacent to said second end of said housing, said retaining means operative to engage said support end and releasably retain said writing element within said housing; and

extension means received in said housing and disposed between said housing and said writing element, said extension means including a helical coil member having an outer portion engageable with said inner surface of said housing and an inner portion disposed in closely surrounding relation to said writing element between said shoulders on said element, said inner portion freely rotatable with respect to said writing element, said extension means being movable between a retracted position in which said support end of said writing element is retained in said second end of said housing and an extended position in which said operative end of said writing element is advanced beyond said first end of said housing, and said coil member pretensioned in a direction to urge said writing element toward said extended position.

4,678,357

DEVICE FOR BINDING HOLED SHEETS

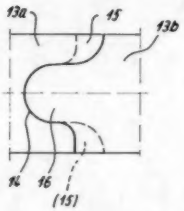
Karl-Heinz Kissel, Espelkamp, and Siegfried Oevermann, Hille, both of Fed. Rep. of Germany, assignors to Robert Krause GmbH & Co. KG, Espelkamp, Fed. Rep. of Germany

Filed Feb. 13, 1986, Ser. No. 829,696

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 8504460[U]

Int. Cl.[4] B42F *3/04*

U.S. Cl. 402—39 **2 Claims**



1. A device for binding holes sheets, comprising an elastic cover connectable to a book-binding cover; supporting elements elastically supported in said elastic cover; and at least two ring halves made of metallic wire and fastened in said supporting elements, said two ring halves having ends cooperating with each other and engageable with one another so as form in a closed position a ring locked so that a displacement of said ring halves relative to each other in a direction transverse to a closing direction is prevented, said ends of said two ring halves each being provided with tooth-shaped projections extended in two different axes and with tooth-gap-shaped recesses receiving respective projections of the other ring half so as to form a locking connection, the direction of axes of recesses (**14**, **17**) being offset by 90° to the direction of axes of said projections (**15**, **16**), a toothed-shaped projection (**15**) of one ring half (**13***a*) being positioned in a middle region of a tooth gap-shaped recess (**14**) of said one ring and a recess (**17**) of the other ring half (**13***b*) being arranged in a middle region of a tooth-shaped projection (**16**) of said other ring half.

4,678,358

GLASS COMPRESSION SEALS USING LOW TEMPERATURE GLASS

Francis W. Layher, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 15, 1985, Ser. No. 754,714

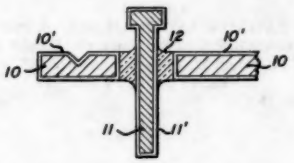
Int. Cl.[4] C03C *27/08*

U.S. Cl. 403—28 **6 Claims**

1. A glass to metal compression seal for accommodating hermetically sealed lead-in conductors in a metal housing, said seal comprising:

a housing consisting of a metal shell having apertures located therein where said lead-in conductors are to be established;

a preplated lead-in conductor extending through each of said apertures; and



a low melting sealing glass, having a working temperature approximately below 480° C., located in said apertures and surrounding said lead-in conductors so as to mechanically secure them in hermetic relationship to said housing, said sealing glass having a thermal coefficient of expansion that is substantially lower than that of said metal shell whereby said seal is under compression after its formation.

4,678,359

DEVICE COMPRISING A FRAME OF LENGTHS OF TUBE AND COUPLING PIECES AND COUPLING PIECE FOR THE SAME

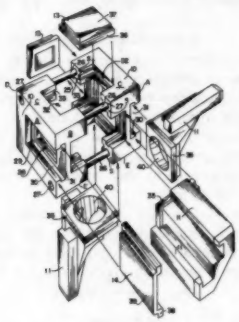
Keen, Egbert, 27, Lijsterbesstraat, 9861 EA Grootegast, Netherlands

Filed Feb. 14, 1985, Ser. No. 701,510

Claims priority, application Netherlands, Feb. 17, 1984, 8400519

Int. Cl.⁴ F16D *1/00*

U.S. Cl. 403—170 **8 Claims**



1. In a composite frame assembly, the combination of a coupling piece of hollow, cubic form presenting two parallel head faces and four side faces, said coupling piece being formed of two identical parts separated along a plane parallel to said head faces to allow said parts to be brought together into the cubic form and so that each side face is perpendicular to such plane; connecting means for securing said parts together; at least one of said side faces having a recess therein leading to the interior of said coupling piece and defining a pair of grooves in each part in which each pair of grooves is aligned with the other pair of grooves at said plane and extends therefrom toward but short of a head face of its corresponding part; an arm member having a base portion and an arm projecting perpendicularly from said base portion to define a longitudinal axis, said base portion defining parallel flanges held captive within said grooves when the parts are secured together so that the arm member may be oriented in one of at least two rotational positions about said axis relative to said one side face prior to said parts being brought together, said arm having a tubing-receiving portion which is asymmetrical relative to said axis; and a length of tubing having an asymmetrical interior adapted to receive said tubing-receiving portion of the arm.

4,678,360

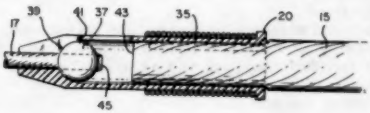
QUICK CONNECT/DISCONNECT ELEMENT FOR LINES

James R. Miller, 4910-23rd Ave., W., Everett, Wash. 98203

Filed Jul. 29, 1986, Ser. No. 891,243

Int. Cl.⁴ B25G *3/00*

U.S. Cl. 403—353 **8 Claims**



1. An article for connecting first and second lines, wherein at least the second line is compressible and has a retainer element which is larger than the diameter of the second line secured thereto in the vicinity of one end thereof, the article comprising:

a connector element having one portion adapted to receive the first line and being configured and arranged such that said first line can be permanently secured in said one portion and having another portion adapted to receive the second line, said another portion including an interior channel which extends into said connector element from one end thereof a distance which is substantially greater than the diameter of the second line and which terminates in an interior cavity, wherein said interior channel has a diameter which is large enough to accommodate the second line but not the retainer element and wherein said interior cavity is large enough to accommodate the retainer element, said connector element further including a slot which communicates said interior channel to the exterior of said connector element and which terminates in an opening which is large enough to admit the retainer element and communicates with said interior cavity, wherein the width of said slot is slightly smaller than the diameter of the second line when it is not compressed but large enough to pass the second line when it is compressed.

4,678,361

SHAFT CONNECTION ARRANGEMENT

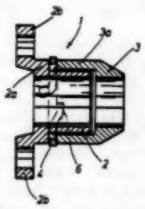
Reinhard Steinkämper, Stuttgart; Wolf Boll, Weinstadt, and Karl Peitsmeier, Neuhausen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 23, 1985, Ser. No. 790,516

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 3438918

Int. Cl.⁴ B25G *3/28*; F16B *3/00*

U.S. Cl. 403—359 **7 Claims**



1. A driving connection for a safety steering column for a vehicle, comprising:

first coupling part means having axial guide means for guiding axial movement of said first coupling part means on a steering shaft means;

second coupling part means having axial guide means for guiding axial movement of said second coupling part means on said steering shaft means;

resilient means interposed between said first and second coupling part means for biasing said first coupling part means and said second coupling part means in opposite rotational direction with respect to one another;

wherein said couling means is a two part bore hub comprisied of a main hub part and additional hub part mounted around said shaft, wherein said shaft and said two part bore hub are splined; wherein said resilient means is a leg spring; and

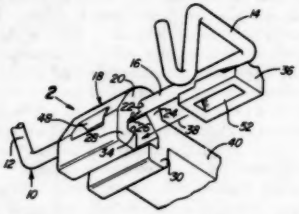
wherein said additional hub part includes a tension nut, and said main hub includes an externally threaded end section for threadably engaging said additional hub part, and wherein said leg spring biases said tension nut in the screwing direction.

4,678,362

SHAFT RETAINER

Joseph T. Betterton, Arab, and Alfred H. Glover, Decatur, both of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 14, 1986, Ser. No. 851,745
Int. Cl.[4] F16B *7/08*
U.S. Cl. 403—373 **2 Claims**



1. A shaft retainer adapted to encircle a shaft midportion without need of axial movement of the shaft end portions through the retainer, comprising:

a body portion of the retainer having circularly configured first channel means extending therethrough and laterally opened sufficiently to receive the midportion of the shaft;

the body portion of the retainer being of sufficiently flexible material to laterally insert the midportion of the shaft into the first channel means for engagement between the retainer body and the shaft over more than 180 degrees of the shaft circumference;

the body portion further having a pair of substantially parallel leg portions which form an aperture therebetween through which the midportion of the shaft can be inserted prior to insertion into the first channel means, the leg means also defining a second channel means between the aperture and the first channel means which is interconnected with the first channel means and the aperture to define a substantially triangularly configured aperture through the body member in a cross-sectional aspect thereof;

a lock key member having a substantially triangular configuration conforming to the configuration of the second channel means so that the lock key member may slide within the body portion in the axial direction of the shaft midportion through the second channel means, the lock key member having an upper curved surface portion adapted to complement the surface of the circular first channel means to provide a full 360 degrees supporting contact with the midportion of the shaft;

window means formed in the body portion of the retainer extending to the second channel means therein;

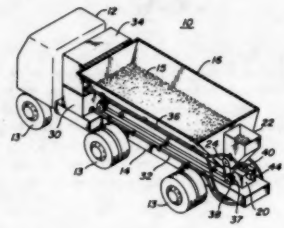
the lock key member having a raised surface means or projection thereon in a position to permit extension into the window means of the retainer body when the lock key member is in a desired axial position along the shaft when in an assembled position.

4,678,363

POTHOLE PATCHER AND ROAD SURFACING DEVICE

Carl L. Sterner, 20838 Nord Rd., Bakersfield, Calif. 93312

Filed Jun. 12, 1986, Ser. No. 873,387
Int. Cl.[4] E21C *19/05*
U.S. Cl. 404—75 **18 Claims**



1. In a movable road repair and surfacing vehicle of the type having a frame, an aggregate material hopper mounted on said frame, a container for binder material, conveyor means associated with said hopper for carrying said aggregate material, a discharge chute associated with said conveyor means for receiving said aggregate material carried thereon and directing said material downwardly, a discharge outlet on said chute for dispensing said aggregate material therefrom for deposit on a roadway surface, and means for spraying said binder material on said dispensed aggregate material, the improved apparatus for applying asphalt coated aggregate to the roadway surface comprising:

a. a hollow tube rotatably mounted within and extending below said outlet of said aggregate discharge chute,

b. at least one projection mounted on the periphery of said hollow tube for premixing said aggregate material moving downwardly in said discharge chute,

c. means attached to said hollow tube adjacent the bottom thereof for causing said aggregate material to swirl as it drops downwardly to said roadway surface from said discharge outlet, and

d. means attached to said vehicle adjacent said discharge outlet for spraying said binder material on said swirling aggregate material after it leaves said discharge outlet but before it reaches said roadway surface.

4,678,364

TRACTOR-DRAWN FORMING TOOL FOR MAKING CONCRETE SLABS ON THE GROUND

Yves Charonnat, Port Saint Pere, and Lucien Larribe, La Celle St. Cloud, both of France, assignors to VIAFRANCE and State of France as represented by the Ministry of Urban Planning, Housing and Transportation, Central Laboratory of Roads and Bridges, Paris, France

Filed Mar. 13, 1986, Ser. No. 839,354
Claims priority, application France, Mar. 14, 1985, 85 03729
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—105 **10 Claims**

1. A molding tool of the sliding mold type for the formation of cementitous concrete slabs form freshly deposited cementitous concrete, made to be tractor-drawn by any tractor-feeder unit able to deposit the cementitous concrete on the ground in a predetermined amount, comprising:

two hitching arms able to be mounted to pivot at their front end, for purposes of traction;

immersion vibration means mounted downstream from the

tractor-feeder unit and made to subject the freshly deposited cementitous concrete to a vibration; and

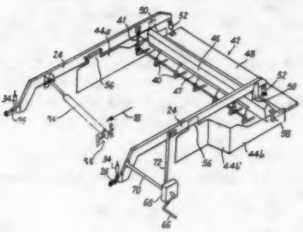
molding means, including:

side elements for confinement of the freshly deposited cementitous concrete;

an upper element having a back part forming an upper molding plate for floating said tool on an upper surface of a layer of freshly deposited cementitous concrete beneath said back part, means for transmitting a reaction force of said layer of said freshly deposited cementitous concrete beneath said back part to said arms; and

a front part rigidly mounted in a region at a back end of said arms donwstream from said immersion means, said front part and said back part being attached to each other along longitudinal edges thereof, said front part being upwardly inclined form said back part,

whereby said tool is floatable and is supported solely upon said upper surface.



4,678,365

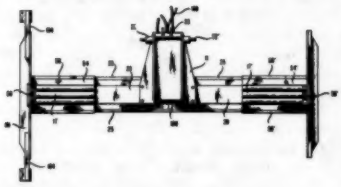
MATERIAL SPREADER

Thomas R. Ban, Redondo Beach; Ernest E. Dusterhoft, Culver City, and John E. Gilmore, Los Angeles, all of Calif., assignors to Tricon Industries, Los Angeles, Calif.

Filed Jan. 24, 1986, Ser. No. 822,276

Int. Cl.[4] E01C *19/22*

U.S. Cl. 404—118 **5 Claims**



1. A spreader apparatus to be towed by a traction device comprising:

a main body section having forward and rear blade surfaces,

at least three pipes longitudinally mounted in a horizontal manner within the main body,

two wings moveably mounted over said main body section, said wings having forward and rear blade surfaces,

at least three pipes longitudinally mounted in a horizontal manner within each of said wings, said pipes positioned to slide coaxially within the main body pipes when the wings are mounted on the main body,

two independently operable hydraulic cylinders mounted within the main body and wings with one end of each hydraulic cylinder attached to the main body and the other end of each hydraulic cylinder attached to each wing, said hydraulic cylinders connected to a system to operatively move the wings across the outer surface of the main body,

a second set of independently operable hydraulic cylinders each vertically mounted at the outer end of each of the wings,

end components moveably mounted to the outer ends of the wings and then secured to the tops of the vertically mounted hydraulic cylinders, said components moveable in a vertical direction,

said second set of hydraulic cylinders connected to a system to operatively move the end components in a vertical direction.

4,678,366

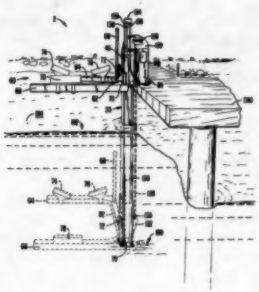
BOAT LIFT

James W. Williamson, P.O. Box 93, Tahoe City, Calif. 95730

Filed Jul. 31, 1985, Ser. No. 761,204

Int. Cl.[4] B63C *3/06*

U.S. Cl. 405—3 **29 Claims**



1. A vessel lift comprising:

a vertical H-beam shaft having a central web and first and second flanges, the central web having first and second faces and the flanges having inner surfaces facing one another;

a slidable shaft housing fitted over said H-beam;

a vessel support frame mounted to said housing;

a vessel lifting mechanism operably coupled to the housing; and

low friction means, mounted to the housing, for engaging the first and second faces of central web and the inner surfaces of the flanges of the H-beam to transfer loading forces exerted by the vessel on the support frame from the housing to the H-beam.

4,678,367

RISER ASSEMBLY FOR A SUB-SURFACE IRRIGATION AND DRAINAGE SYSTEM

James I. Warner, R.R. 2, Box 106, Fairfield, Iowa 52556

Filed Jan. 29, 1986, Ser. No. 823,725

Int. Cl.[4] E02B *11/00, 13/00*

U.S. Cl. 405—39 **19 Claims**

1. A riser assembly for a sub-surface irrigation and drainage system having at least one underground tile pipeline, the riser assembly comprising:

(a) a housing defining a hollow, elongated, upwardly opening cavity, the housing having an upstream side and downstream side;

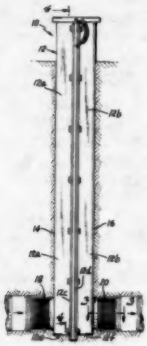
(b) an upstream tile section mechanically interlocked with the material forming the upstream side of the housing so as to be permanently attached thereto;

(c) a downstream tile section mechanically interlocked with the material forming the downstream side of the housing so as to be permanently attached thereto;

(d) a divider mounted within the housing and extending

generally parallel to the upstream and downstream sides so as to divide the elongated cavity into an upstream chamber communicating with the upstream tile section and a downstream chamber communicating with the downstream tile section, the divider defining a lower drainage opening and an upper weir opening;

(e) a first gate valve slidably attached to the divider adjacent



the lower drainage opening such that, as the gate valve is raised or lowered the drainage opening is opened or closed, respectively; and,

(f) a second gate valve slidably attached to the divider adjacent to the upper weir opening to adjust the height to which the water must rise to pass from the upstream chamber to the downstream chamber when the drainage opening is closed.

4,678,368

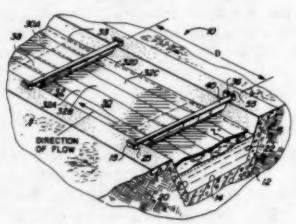
CANAL COVERING SYSTEM AND METHOD OF INSTALLING SAME

Frederick D. Helversen, 300 Sand Hill Cir. #206, Menlo Park, Calif. 94025

Filed Jul. 11, 1986, Ser. No. 884,648

Int. Cl.[4] E02B *5/00, 13/00*

U.S. Cl. 405—118 **10 Claims**



1. A floating cover system for a water transportation canal having opposite banks and defining a channel therebetween for containing water with the surface of the water exposed to the environment, said cover system comprising:

(a) a first cover assembly including:

(i) anchor means located at opposite banks;

(ii) a transverse support member extending between said anchor means and removably received therein; and

(iii) cover means having a free end and a fixed end secured at said support member and adapted to float upon and overlie the fluid surface;

(b) a second cover assembly including:

(i) anchor means located at opposite banks;

(ii) a transverse support member extending between said anchor means and removably received therein; and

(iii) cover means having a free end and a fixed end secured at said support member and adapted to float upon and overlie the fluid surface; and

(c) said second cover assembly being spaced from said first cover assembly a predetermined distance along said canal whereby a portion of the first cover assembly spaced from the said free end of the first cover assembly overlaps a predetermined portion of the second cover assembly when fluid is flowing in the said channel.

4,678,369

METHOD AND ARRANGEMENT FOR SEALING OFF DUMPS TO PREVENT SEEPAGE

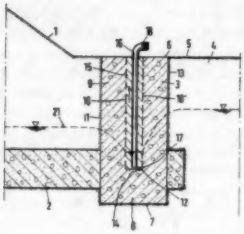
Eberhard Gläser, Aichwald, Fed. Rep. of Germany, assignor to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,385

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419163

Int. Cl.[4] B09B *1/00*

U.S. Cl. 405—129 **23 Claims**



1. An apparatus for vertically sealing off dumps to prevent the seepage of water therefrom, including a sealing wall directed upwardly around the dump area which is to be sealed off; said apparatus comprising:

at least one drainage sheet which extends circumferentially around the dump area including the peripheral length of said sealing wall, said drainage sheet having a permeability value greater than that of said sealing wall;

means for producing in said sealing wall a hydraulic gradient relative to the surroundings via liquid level in said drainage sheet lying lower than liquid level in a region externally of the apparatus;

means for collecting said seepage water in said at least one drainage sheet via said hydraulic gradient;

means for determining in a controlled manner the occurrence and quantity of said seepage water; and

means for withdrawing accumulated seepage water from said at least one drainage sheet of said sealing wall.

4,678,370

SEWER RENOVATION SYSTEM

Peter Allen, Queensland, Australia, assignor to Danby Pty. Ltd., Queensland, Australia

Filed Oct. 16, 1985, Ser. No. 788,019

Claims priority, application Australia, Dec. 4, 1984, PG8408; May 16, 1985, 42585/85

Int. Cl.[4] F16L *1/00, 9/16, 55/18*

U.S. Cl. 405—154 **3 Claims**

1. A method of lining a sewer pipe including the steps of:

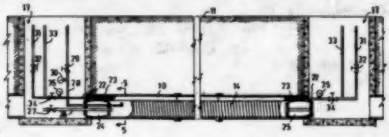
continuously forming a liner of helically wound and interengaging strip and feeding it into a sewer to be lined;

sealing the end portions of the thus formed liner to the sewer pipe;

setting removable plugs into the ends of the liner;

pressurizing the liner by introducing fluid thereinto under pressure, said plugs retaining such fluid in said liner;

pumping a cementitious grout under pressure into the space between the liner and the pipe, the grout being introduced initially by inlet pipes to a lower part of the space while



permitting displaced air to be removed from the upper part of the space, and being subsequently introduced by further inlet pipes to the upper part of the space to totally fill the space; and

removing the plugs from the ends of the liner after the grout has set.

4,678,371

BURYING DEVICE FOR SUBMARINE CABLES AND METHOD FOR GUIDING THE SAME

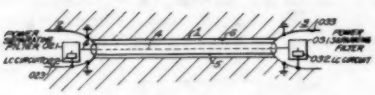
Kazuomi Yamamura, Yokohama; Hideo Ishihara, Kamakura; Yoshinao Iwamoto, Fujimi; Shizuo Suzuki, Yokohama; Yuichi Sirasaki, Tokyo, and Kenichi Asakawa, Hachiohji, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 746,345, Jun. 19, 1985, abandoned, which is a division of Ser. No. 282,876, Jul. 31, 1981, Pat. No. 4,540,942. This application Jul. 10, 1986, Ser. No. 883,450

Claims priority, application Japan, Jul. 16, 1980, 55-96252; Jul. 16, 1980, 55-96253

Int. Cl.[4] F16L *1/04*

U.S. Cl. 405—164 **2 Claims**



1. A method of guiding cable burying apparatus, for burying a submarine cable, comprising the steps of:

(a) coupling a tracking signal supplying device having an exciter coil, to the submarine cable;

(b) supplying an AC signal current to the exciter coil to thereby induce an AC signal current, as a tracking signal, in the submarine cable;

(c) detecting the position of said submarine cable with an AC signal magnetic field generated by the induced AC signal current, with a magnetic sensor system on the cable burying apparatus; and

(d) guiding the cable burying apparatus along the submarine cable in accordance with the detected position, the burying the submarine cable.

4,678,372

RAISING METHOD AND DEVICE, IN PARTICULAR FOR AN OIL EXPLOITING PLATFORM

Jean Pierre Cousty, Bezons, France, assignor to Technip Geoproduction, Paris La Defence, France

Filed Aug. 7, 1986, Ser. No. 894,120

Claims priority, application France, May 2, 1986, 86 06402

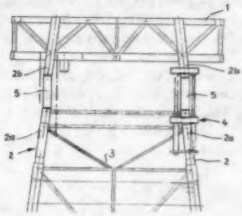
Int. Cl.[4] E02B *17/08*

U.S. Cl. 405—196 **12 Claims**

1. A method for raising in particular an offshore oil exploiting platform comprising legs bearing on the sea bed, and a deck carried by the legs, said method comprising the following steps:

(a) fixing on each of the legs a raising device forming a reinforcing device having regions of the fixing of the device to the respective leg which are located on each side of a region of the leg to be cut, and putting the raising device under load;

(b) effecting in said cutting region of the leg a cut so as to divide the leg into a lower portion which bears on the sea bed and an upper portion connected to the deck;



(c) when all the legs of the platform have been cut, actuating the raising devices associated with the respective legs so as to shift the platform to an extent corresponding to the desired raising while controlling the attitude of the platform, and fixing between the ends of the portions of each leg a heightening element which again interconnects the two portions of the leg, and

(d) removing the raising devices.

4,678,373

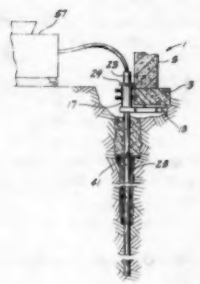
APPARATUS FOR AND METHOD OF SHORING A STRUCTURE

George F. Langenbach, Jr., Crestwood, Mo., assignor to Perma-Jack Company, St. Louis, Mo.

Filed Mar. 27, 1985, Ser. No. 716,746

Int. Cl.[4] E02D *5/20, 35/00*

U.S. Cl. 405—230 **20 Claims**



1. A shoring system comprising support means engageable with a foundation or the like, a pile adapted to be driven into the ground adjacent the support means, said pile having a substantially uniform outer diameter, a plurality of footing structures, one or more of which are adapted to be selectively mounted in fixed position relative to the pile on the outside of the pile to extend circumferentially of the pile in a plane generally at right angles to the central longitudinal axis of the pile, each footing structure having an outer diameter substantially greater than the outer diameter of the pile and being engageable with the soil as the pile is driven downwardly thereby substantially to increase the load-bearing capability of the pile by increasing its resistance to downward movement through the soil whereby the depth to which the pile must be driven to shore the foundation is reduced, and means for securing the pile to said support means after said pile and said one or more

footing structures thereon have been driven to a depth sufficient to shore the foundation.

4,678,374

ROOF BOLT WITH EXPANSION SHELL AND THREADED NUT

Frank Calandra, Jr., Pittsburgh, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 808,874, Dec. 13, 1985, abandoned, which is a continuation of Ser. No. 644,347, Aug. 27, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 908,338

Int. Cl.[4] E21D *20/02*

U.S. Cl. 405—261 **10 Claims**

1. Apparatus for supporting a rock formation comprising,

an elongated rod positioned in a bore hole of a rock formation,

said rod having a first threaded end portion and a second threaded end portion,

said rod first threaded end portion being positioned adjacent the end of the bore hole, said rod second threaded end portion extending out of the bore hole,

an expansion shell assembly engaged to said rod first threaded end portion,

a bearing plate positioned on said rod second threaded end portion,

a nut engaging said rod second threaded end portion below said bearing plate,

stop means for abstructing axial movement of said nut beyond a first position on said rod second threaded end portion to permit said initial rotation in said preselected direction of said nut and said rod as a unit,

said expansionshell assembly operable upon rotation of said rod in said bore hole to anchor said rod in a fixed position in said bore hole,

said stop means being operable to permit axial movement of said nut on said rod second threaded end portion when a predetermined torque is exceeded during said continued rotation of said nut and said rod in said preselected direction, and

said nut being rotatable relative to said rod and operable to advance during further rotation of said nut in said preselected direction to a second position on said rod second threaded end portion to urge said bearing plate against said rock formation and tension said rod.

4,678,375

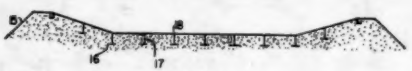
COVERING OR LINER SYSTEM AND METHOD FOR CONSTRUCTING THE SAME

Duane W. Gagle, Bartlesville; Duane W. Gagle, Jr., Tulsa; Richard L. Gagle, Broken Arrow, all of Okla., and Paul L. Gomory, Bethesda, Md., assignors to Gagle Company, Inc., Broken Arrow, Okla.

Filed Mar. 5, 1984, Ser. No. 586,128

Int. Cl.[4] E02B *3/00*

U.S. Cl. 405—270 **29 Claims**



1. A system composed by joining together as at their edges, a multiplicity of sections of impervious material comprising: an impervious liner layer of the joined sections which as being installed and joined together and thereafter can have a substantial portion of its area exposed to the atmosphere and which in position of said joined sections is able to withstand dislodgement or damage by wind and/or ground fluid, said liner layer being adapted to contain, retain, or to fend off a fluid from contact as with a substance below it; non-liner perforating anchoring means all of which is disposed entirely below said liner layer; said liner layer being attached to said anchoring means at a plurality of loci distributed throughout the area espoused by said portion of said system; said anchoring means being adapted to hold down and holding down said liner layer entirely from below said liner layer at each of said plurality of loci of said liner layer in a stable, fixed, desired position and in a manner such that at each said loci of said liner layer the acting fixing strength of said anchoring means is at least equal to the maxiumum force of said wind and/or fluid expected to act at any time at said loci regardless of whether any force is acting at said time at any other said loci of said liner layer; said loci being arranged at places at which said sections are joined together.

4,678,376

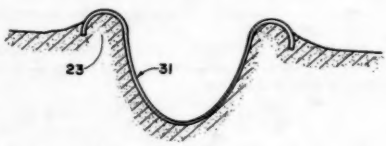
METHOD OF CONSTRUCTING MEANS FOR DIRECTING OR HOLDING WATER

John D. Gavin, Jr., and Michael D. Meddaugh, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 30, 1981, Ser. No. 288,254

Int. Cl.[4] E02B *5/02*

U.S. Cl. 405—270 **8 Claims**



1. A method of constructing a means suitable for directing, transporting, or holding water comprising

(A) treating the surface soil of the earthen depression by spraying the surface with a first aqueous liquid silicone elastomeric emulsion curable at atmospheric conditions having a solids content of from about 10 percent ot about 20 percent by weight, thereafter,

(B) spraying the surface with a second aqueous liquid elastomeric emulsion curable at atmospheric conditions comprising

(a) 100 parts by weight of an anionically stabilized, hy-

droxyl endblocked polydiorganosiloxane present as an oil-in-water emulsion,

(b) from 1 to 150 parts by weight of colloidal silica,

(c) from 0 to 200 parts by weight of filler other than colloidal silica, and

(d) from 0.1 to 2.0 parts by weight of alkyl tin salt, said emulsion having a pH of from 9 to 11.5, the solids content of the emulsion being greater than 25 percent by weight based on the total weight of the emulsion, and simultaneously spraying chopped glass fibers into the emulsion at a rate sufficient to incorporate from 5 to 10 percent by volume of glass fibers based on wet emulsion coating;

(C) allowing the emulsion coating to cure a reinforced membrane imprevious to liquid water; then

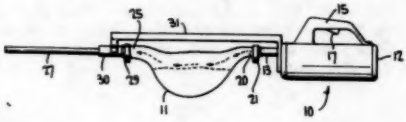
(D) stabilizing the membrane edges by burying.

4,678,377

DISPENSER FOR PARTICULATE MATTER

Antoine J. Bouchard, 131 Milford St., Ext., Apt. 6B, Plainville, Conn. 06062

Filed Apr. 19, 1985, Ser. No. 725,248
Int. Cl.[4] B65G *53/38*
U.S. Cl. 406—139 **6 Claims**



1. Apparaus for dispensing particulate matter via a gaseous stream comprising:

an amorphous, peripherally manipulable and flexible bag for containing said particulate matter, said bag having a gas inlet opening and a gas outlet opening;

means for delivering a stream of gas into said bag via said inlet opening;

means for discharging said gas from said bag via said outlet opening; and

structural means for positioning said outlet opening in fixed spaced relation to said inlet opening;

wherein said bag is manipulable to control the position of particulate matter therein to thereby control the amount of particulate matter discharged from said bag with said gaseous stream;

wherein said means for delivering issues said stream of gas into said bag in a downstream direction, and wherein said structural means includes means for positioning said outlet opening generally downstream of said inlet opening;

wherein said means for discharging is an air blower assembly having an air output port secured to said gas inlet inflow communication therewith, and wherein said structural means comprises:

extension means rigidly secured to said air blower assembly and extending generally downstream from said air output port; and

clamping means for securing said extension means to said bag proximate said outlet opening.

4,678,378

ADJUSTABLE DUAL DRILL ASSEMBLY

Jack B. Koczarski, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 2, 1986, Ser. No. 881,535
Int. Cl.[4] B23B *39/18, 41/00*
U.S. Cl. 408—46 **4 Claims**

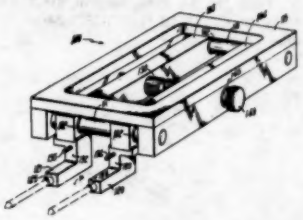
1. An assembly for a dual-bit drillgun having two flexible drive shafts and for drilling two holes spaced relative to a primary hole in a workpiece comprising:

two guide shafts (110,111);

two bars (105,106) mounted on said guide shafts and movable relative to each other;

two block assemblies (120,121) attached to each of said two bars (105,106);

two rotatable shafts (125,126), each shaft passing through one of said block assemblies, each shaft having means adapted to receive a drill bit at one end thereof, and to be secured to a drive shaft at the other end thereof;



a threaded adjustment shaft means (130) interconnecting said bars (105,106) for varying the spacing between the bars; and

a clamp assembly (200) mounted on said drill gun and including means (204,230,235,236,240,241) for releaseably securing the block assemblies (120,121) at a selected spacing; and

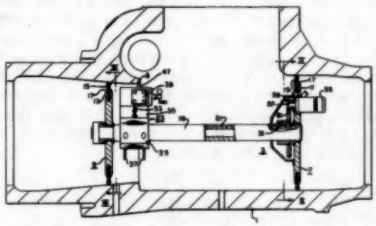
means for engaging the primary hole in a workpiece.

4,678,379

APPARATUS FOR MACHINING A VALVE'S SEAT

Lester R. Sunday, Springfield, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 26, 1986, Ser. No. 844,497
Int. Cl.[4] B23B *41/00*
U.S. Cl. 408—83.5 **1 Claim**



1. Apparatus for machining a seat ring of a valve, said apparatus comprising:

a pair of spiders having a plurality of adjustable arms which extend outwardly to contact an inner wall of said valve;

a shaft having an end rotatably disposed in each of said spiders so that the shaft is axially aligned with the axis of said valve seat ring and having a keyway extending lengthwise along its length;

means for rotating said shaft;

a tool support affixed to said shaft at any location between said spiders by a key and split hub which clamps said shaft;

said tool support having disposed thereon means for holding a cutting tool and for moving said cutting tool axially with respect to said shaft;

said cutting tool being a single edge cutting tool, having a cutting edge ground to cut the proper shaped seat ring; and

said tool support having means for radially adjusting the means for holding the cutting tool and moving it axially

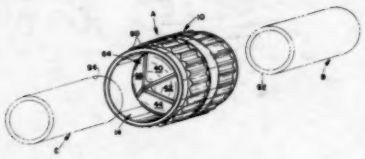
with respect to the axis of the shaft to machine the seat ring of a valve.

4,678,380

DEBURRING TOOL

Emery J. Zahuranec, Novelty, and James C. Musil, Sagamore Hills, both of Ohio, assignors to Crawford Fitting Co., Solon, Ohio

Filed Jan. 17, 1986, Ser. No. 819,722
Int. Cl.[4] B23B *5/16*; B23D *79/08*
U.S. Cl. 408—211 **14 Claims**



1. A hand tool for deburring peripheral end portions of a generally cylindrical workpiece, said tool comprising:

a generally cylindrical housing having a longitudinal axis extending axially thereof, said housing having first and second open ends;

a generally conical blade support means disposed in said housing so as to have a base area adjacent said housing first end and an apex area spaced toward said housing second end at said longitudinal axis, said support means including plural apertures extending radially outward from said apex area in a first predetermined pattern and each having a predetermined unstressed width dimension;

a blade assembly mountingly supported by said support means, said blade assembly including a plurality of individual blades fixedly connected together so as to define a second predetermined pattern identical to said first pattern and received therein, each of said blades having first and second cutting surfaces spaced axially outward from inner and outer surfaces of said support means, each blade further having a predetermined thickness dimension which is substantially greater than said unstressed aperture width dimension whereby said blade assembly is retained in a desired supported position relative to said support means by a presss fit relationship generated between each of said blades and respective apertures.

4,678,381

PORTABLE MACHINING TURNTABLE

Earl D. Bailey, 2255 Montrose Ave., Montrose, Calif. 91020

PCT No. PCT/US82/00381, § 371 Date Nov. 7, 1983, § 102(e) Date Nov. 7, 1983, PCT Pub. No. WO83/03378, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 29, 1982, Ser. No. 575,170
Int. Cl.[4] B23Q *3/02, 17/00*
U.S. Cl. 409—221 **10 Claims**

1. A portable machining turntable comprising:

(a) an integral elongated housing having two pairs of opposed parallel side walls forming a square cross section adapted to be clamped by a standard machine vise, and a top wall having a shallow third cavity or recess, said side walls and top forming a first cavity extending upwardly from the bottom, having a shallow second cavity extending over the opening of the first cavity, a first threaded bore located on one of the side walls of the first cavity in alignment with a second bore located on the opposite side wall, a third bore extending from the top of said housing and aligned with the center of the first cavity, a first threaded hole extending through one of the side walls in alignment with a second threaded hole through the opposite side wall, and a plurality of hold-down slots located in the lower outer sides of said said walls of said housing,

(b) a first bushing and a second bushing inserted within the first bore and second bore respectively,

(c) a worm drive assembly comprising:

(1) a worm shaft where the ends of said shaft are rotatably inserted and retained by said first bushing and said second bushing,

(2) a worm rigidly attached to said shaft,

(3) a first geared pulley rigidly attached to said shaft,

(4) a worm shaft retaining nut screwed into the first bore, where end of the worm shaft protrudes outside the nut,

(d) an electric stepping motor rigidly mounted to one of the inside walls in the first cavity of said housing,

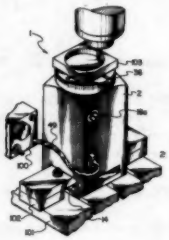
(e) a second geared pulley rigidly attached to the shaft of said motor, and located on the same plane as said first geared pulley,

(f) a timing belt looped around and held tight by said first geared pulley and said second geared pulley,

(g) a first ball bearing race assembly having a plurality of bores housing an equal plurality of ball bearings and having a central bore extending therethough where said assembly is set within the third cavity in said housing,

(h) a rotary head assembly comprising:

(1) a circular rotary head having a concentric first shaft and a contiguous second shaft of lesser diameter than the first shaft where a bottom of said head rests on top of said first ball bearing race assembly and where the first shaft extends through the bore in said first ball



bearing race assembly and through the third bore in said housing,

(2) a second ball bearing race assembly having a plurality of bores housing an equal plurality of ball bearings and having a central bore extending therethrough where said assembly is inserted about the second shaft of said rotary head,

(3) a bushing inserted into the second shaft,

(4) a pressure plate inserted onto the second shaft of said rotary head around said bushing and thus maintains the second ball bearing race assembly against the bottom of the first shaft,

(5) a spacer inserted onto the second shaft where an upper end of said spacer rests against the bottom of said pressure plate,

(6) a worm gear inserted onto the second shaft where its upper end rests against the bottom of said spacer, such that said worm gear meshes with said worm, where said worm gear is held radially stationery by a key lock and is maintained longitudinally in place by a combination compression washer and bolt inserted into the end of the second shaft,

(i) a set of brakes and a corresponding set of brake adjusting screws inserted into the first threaded hole and second threaded hole in said housing,

(j) an electrical female plug externally inserted through a fourth bore and attached to a wall of said housing, and

(k) an electrical power cable having a corresponding male

connector that attaches to said female plug and supplies the power to operate said electric stepping motor.

4,678,382

MACHINE TOOL SPINDLE AND TOOL HOLDERS SUITABLE FOR USE THEREWITH

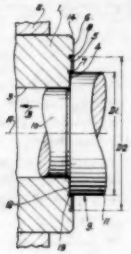
Otto Eckle, Loechgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,852

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 8519794[U]

Int. Cl.⁴ B23C *5/26*; B23Q *3/12*

U.S. Cl. 409—232 **6 Claims**



1. In a machine tool spindle and tool holders suitable for use therewith, which spindle has a cylindrical bore in its free end part and at least one annular supporting surface surrounding the receiving bore, disposed at right angles to the axis of the spindle and located at the front end of the latter, in which a tool holder capable of being inserted in the spindle has a cylindrical mating projection which fits accurately in the receiving bore, a cylindrical shank adjacent the mating projection and coaxial therewith, which shank is of larger diameter than the mating projection, and an annular surface located at the transition between the shank and the mating projection, arranged concentrically with the latter and extending at right angles to the axis of the shank, which annular surface after insertion of the mating projection in the receiving bore, abuts against the annular supporting surface, the improvement comprising wherein a plurality of annular supporting surfaces which are concentric with one another are formed on the front end of the spindle, which supporting surfaces are separated from one another by annular grooves formed in the front end surface and wherein the shanks of the tool holders, in cases where the mating projections are of equal diameter, have diameters which differ stepwise from one another, the outside diameter of each supporting surface being slightly smaller than the outside diameter of the annular surface of the corresponding tool holder and furthermore the radially further inwardly located supporting surface being arranged so that it is axially spaced from the opposite radial surface of the tool holder when the annular surface of a tool holder is in contact with the corresponding supporting surface.

4,678,383

EXPANSION ANCHOR ASSEMBLY

Arndt Bergner, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fed. Rep. of Germany

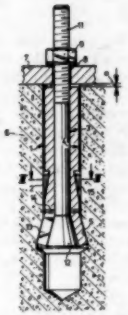
Continuation of Ser. No. 638,743, Aug. 8, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,652

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329732

Int. Cl.⁴ F16B *13/04*

U.S. Cl. 411—32 **3 Claims**

1. An expansion anchor assembly to be secured in a bore with an undercut section located in the surface of the bore adjacent the base thereof, said expansion anchor assembly comprises an axially elongated expansion sleeve having a first end arranged to be inserted first in the bore and a second end, said sleeve being slit in the axial direction for a portion of the axial length thereof from the first end toward the second end, said sleeve having an axially extending length so that the second end thereof is recessed inwardly from the opening into the bore, an axially elongated anchor bolt located within and extending completely through said expansion sleeve, said anchor bolt having a first end located in the region of the first end of said expansion sleeve and a second and extending outwardly from the second end of said expansion sleeve, said anchor bolt having an expansion cone formed on the first end thereof with said cone arranged to be drawn into the first end of said sleeve for radially outwardly expanding the slit portion of said sleeve into the undercut section in the bore formed on the second end of said anchor bolt for applying a load, said expansion sleeve having an axially extending cylindrically shaped outside surface of a constant diameter between the first and second ends thereof with a circumferentially extending annular recess formed therein extending radially inwardly from said outside surface, said recess is located in the axially extending part of said expansion sleeve spaced from and between said slit portion



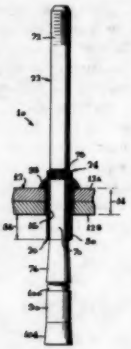
thereof and the second end of said expansion sleeve, said annular recess having an annular base extending in the axial direction of said sleeve and spaced radially inwardly from the outside surface decreasing in the direction toward the first end of said expansion sleeve, and annular expansion element seated within said recess with a cylindrically shaped radially outer surface on said expansion element extending in the axial direction of said annular recess for a dimension less than the axial extent of said recess and said radially outer surface extending outwardly at least to the outside surface of said expansion sleeve, said expansion element has a radially inner surface and a radially outer surface with the radially inner surface in contact with the base of said recess and said sleeve whereby said inner surface tapers inwardly toward the axis of said sleeve in the direction toward the second end of said sleeve, and with the radially outer surface of said expansion element arranged to effect frictional contact with the surface of the bore during the radial expansion of said expansion sleeve for preventing axial displacement of expansion sleeve out of the bore while said expansion cone radially displaces and expands the slit portion of said sleeve into anchoring engagement with the undercut section of the bore.

4,678,384

CONTROLLED EXPANSION BLIND FASTENER DESIGN

Kenneth P. Sparling; David G. Richardson, both of Burbank; Angelo Incardona, Huntington Beach; Ronald E. Wood, Sepulveda; Garth D. Kikendall, Highland Park, and Leon Bakow, Sherm Oaks, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Jun. 13, 1986, Ser. No. 873,927
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—43 **5 Claims**



1. A blind fastener for joining adjacent structural elements together, the structural elements having at least one aligned hole of a predetermined diameter for receiving the fastener, the fastener including:

a hollow tubular sleeve including;

a shank portion having an outer diameter with a minimum and maximum allowable value;

an inner diameter of betweeen 0.9000 times the minimum sleeve outer diameter and 0.8964 times the maximum sleeve outer diameter; and

a head portion for abutting against one side of the adjacent structural elements at one end of said shank portion and an opposite end for extending beyond the other side of the structural elements;

a spindle including;

a stem portion having a diameter equal to or less than said inner diameter of said sleeve for pulling said spindle partially through said sleeve;

a cold work mandrel portion for expanding said sleeve when drawn through said inner diameter, said mandrel portion having first and second ends with said first end attached to said stem portion said mandrel portion further having an increasing taper from said first end to said second end with said first end of said mandrel portion having a diameter between 0.8789 times said minimum sleeve outer diameter and 0.8756 times the maximum sleeve outer diameter and said second end of said mandrel portion having a diameter between 0.9684 times the minimum sleeve outer diameter and 0.9585 times the maximum sleeve outer diameter and a length of between 2.000 times the minimum sleeve outer diameter and 2.1000 times the maximum sleeve outer diameter;

a shear pin portion having first and second ends, and a diameter between 0.9632 times the minimum sleeve outer diameter and 0.9534 times the maximum sleeve outer diameter, said first end of said shear pin portion frangibly attached to said second end of said mandrel portion;

a sleeve expanding portion attached to said second end of said shear pin portion for expanding said opposite end of said sleeve when said spindle is partially drawn through said inner diameter; and

locking means for locking said shear pin portion to said sleeve when said spindle has been drawn partially through said sleeve.

4,678,385

FIXING PEG

Jean Ollivier, Valence, and Roland Almeras, Tournon, both of France, assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed May 14, 1986, Ser. No. 863,067
Int. Cl.[4] F16B *15/06*
U.S. Cl. 411—456 **8 Claims**

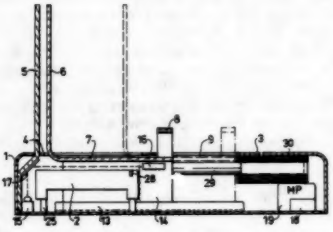
1. A fixing peg comprising a generally tubular shaped resilient body having a longitudinal slit and integral bearing means at one end of the body, said slit extending over a substantial portion of the length of said body, edges of said body adjacent said slit defining lips, abutment means for limiting constrictive movement of said lips, said abutment means including at least one tongue struck from a portion of said body opposite said slit and extending into said slit.

4,678,386

THERMAL SHEET BINDING APPARATUS AND A METHOD FOR BINDING OF LOOSE SHEETS IN A FOLDER

Sture H. Wiholm, Johanneshov, Sweden, assignor to Bind-O-Matic AB, Stockholm, Sweden

Continuation of Ser. No. 752,507, Jul. 5, 1985, abandoned. This application Jul. 17, 1986, Ser. No. 885,390
Int. Cl.[4] B42C *19/00*
U.S. Cl. 412—8 **8 Claims**



1. A sheet binding apparatus comprising

a housing;

a heating assembly supported in the housing;

an opening in the housing above said heating assembly for insertion of one or more folders;

a front support means and a rear support means restricting the width of said opening, said front support means being movable to adjust the opening width with respect to the number and/or thickness of folders inserted;

an electric heating element means included in said heating assembly;

a top surface of said heating assembly being heated by said heating means when said folder or folders is/are in touch with the top surface to activate a heat-sensitive binding agent provided in each folder for binding loose sheets inside the folder(s);

an electric supply circuit feeding said heating means, and

an electrical transformer having a movable yoke and means mechanically connecting said yoke to said front support

means included in the electric supply circuit and being dependent on the opening width to adjust the current supplied to the heating means in relation to the total thickness of the folder or folders inserted.

7. A method for binding in thermal binding apparatus of loose sheets in one or more folders having a heat-sensitive binding agent, the method comprising the following steps:

(a) inserting one or more folders, each one including some loose sheets to be fixed to the folder, in the apparatus to touch with a heating assembly, thereby breaking a light beam detected by a photocell;

(b) sending a start signal produced by said photocell to a micro-processor, thereby closing a power supply circuit to a heating element means of said heating assembly;

(c) controlling the current from the power supply through a rheostat, the position of which is dependent on the thickness of folders inserted;

(d) sending temperature indication signal generated by a thermistor in close connection to said heating assembly to the micro-processor for starting a timer when the heating assembly reaches a working temperature, said timer being set for a predetermined time;

(e) sending an interruption signal obtained from the timer at the end of the predetermined time period to said micro-processor to open the power supply circuit; and

(f) removing the folder(s) with the sheets now fixed thereto whenever wanted.

4,678,387

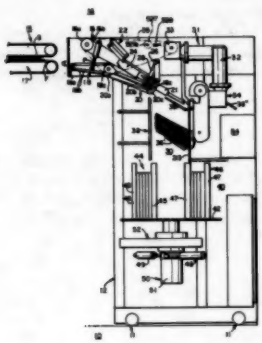
SIGNATURE STACKER

Christer A. Sjogren, Miami, and Carl D'Amico, Ft. Lauderdale, both of Fla., assignors to Quipp Incorporated, Miami, Fla.

Filed Mar. 1, 1985, Ser. No. 707,494

Int. Cl.[4] B65G *57/11*; B65H *31/28*

U.S. Cl. 414—47 **25 Claims**



1. Stacking apparatus comprising:

a bucket for receiving and stacking signatures delivered thereto in an overlapping stream;

drive means being energizable for selectively driving said bucket about a closed loop path;

means for pivotally mounting said bucket to said drive means;

cam means;

cam follower means on said bucket including means for urging said cam follower means toward sliding engagement with said cam means;

said cam means including an abrupt transition at a home position along the closed loop path;

holding means for receiving said cam follower means at said home position;

reciprocating means for moving said holding means in a first direction for swinging said bucket about said pivotal mounting means for swinging the free end of said bucket into the path of movement of signatures being delivered to said stacking apparatus;

said holding means including a pair of spaced guides enabling movement of said cam follower means through said holding means and along a stacking portion of said closed loop path for receiving and stacking signatures on said bucket upon activation of said drive means.

4,678,388

APPARATUS FOR COUNTING AND COLLECTING PAPER BOARDS

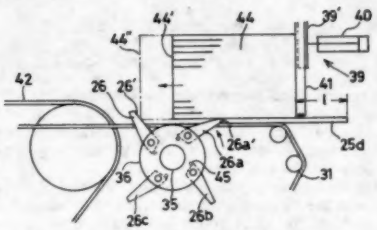
Arifumi Okamoto, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 738,510, May 28, 1985, abandoned, which is a continuation of Ser. No. 460,981, Jan. 25, 1983, abandoned. This application Aug. 28, 1986, Ser. No. 902,077

Claims priority, application Japan, Feb. 2, 1982, 57-15155

Int. Cl.[4] B65G *57/30*

U.S. Cl. 414—92 **5 Claims**



1. An apparatus for counting and collecting paperboards comprising a suitably disposed device for counting said paperboards brought by a conveyor device, means for heaping said paperboards successively from the bottom thereof by restraining their movement including a stopper disposed on the surface of a conveyor, and means for transferring them to a further process each time they are collected in a predetermined number wherein said stopper is composed of a shaft for rotating through a predetermined angle of not more than about 45° intermittently in response to a signal from said counting device, a plurality of stopper members which are disposed around said shaft and are mounted on the shaft for rocking movement relative to the shaft and which are urged in the rotational direction of said shaft, and means, disposed on said shaft, for restraining the rocking movement of each stopper member in the vicinity of an upright position thereof, and wherein rotation of the shaft through the predetermined angle rotates a first stopper member from the upright position in which paperboards are heaped into a stack to an adjacent position in which the stack of paperboards are held between the first stopper member and a second stopper member, the second stopper member retaining the next paperboard which is to be the first paperboard of a new stack.

4,678,389

FREIGHT VEHICLE WITH A CONVERTIBLE CARGO SPACE

Timothy C. Bonerb, Orchard Park, N.Y., assignor to Vincent C. Bonerb, Boston, N.Y.

Continuation-in-part of Ser. No. 480,499, Mar. 30, 1983, Pat. No. 4,534,596. This application Nov. 21, 1984, Ser. No. 673,770

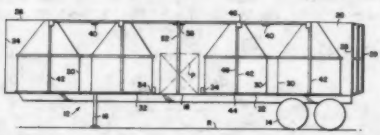
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] B60P *1/56*; B65G *65/30*

U.S. Cl. 414—267 **17 Claims**

1. A freight vehicle having a cargo space convertible from a piece goods handling mode with a space suitable for piece goods to a bulk goods handling mode with space suitable for bulk material, the vehicle being of the type including means defining a cargo space having a bottom load-bearing floor, side

and end walls, and a roof, and door means providing access to the cargo space for loading and unloading piece goods cargo therein, characterized by means defining a discharge opening in the vehicle for emptying bulk material cargo from the cargo space, means defining a fill opening in the vehicle, an inflatable double-walled generally cup-shaped bag having an inner and an outer wall for containing bulk cargo, the bag having an outlet opening positionable to register with the discharge opening in the vehicle, means for connecting the fill opening to the top edge wall of the bag, inlet means for inflation and deflation of the bag, the inflation causing expansion of the inner bag wall to assist in gravity discharge of the material after its angle of repose is reached or the material stops flowing, a rigid bag bottom support platform supporting the bag bottom and removably secured to the floor when the cargo space is used in



a bulk material handling mode, mechanical means for maintaining the bag in an erected position when the bag support platform is on the floor and the cargo space is in the bulk-handling mode, hoisting means for raising the bag bottom support platform from the floor of the cargo space to an upper position with the bag support platform adjacent to the roof of the cargo space with the bag collapsed to convert the cargo space to space suitable for piece goods handling, and supplemental discharge means for discharging material remaining in the bag following full inflation of the bag, the supplemental discharge means including a supplemental inflatable flexible membrane connected to the support platform at the bag outlet and attached to the inner surface of the inner bag wall, the supplemental membrane having a supplemental inlet for inflation thereof.

4,678,390

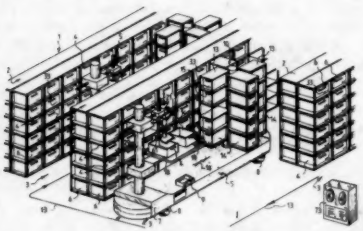
AUTOMATED SELF-POWERED MATERIAL HANDLING TRUCK

Marc Bonneton, Tourcoing, and Dominique Janvier, Lille, both of France, assignors to Societe Anonyme REDOUTE CATALOGUE, Roubaix, France

Continuation-in-part of Ser. No. 652,348, Sep. 19, 1986, abandoned. This application Mar. 26, 1986, Ser. No. 844,455

Int. Cl.[4] B65G *1/06*

U.S. Cl. 414—282 **15 Claims**



1. An automated handling system intended for a storehouse, ware-house or other industrial premises in which miscellaneous articles are stored, for allowing either the restocking of the storehouse or the regrouping of articles picked up in the storehouse to constitute lots of articles corresponding to a cutstomer's order, said storehouse comprising an assembly of modular racks, a plurality of lanes along which said modular racks are disposed, and a multiplicity of unitary stock bins in which said articles are stocked according to their nature and reference symbol, said racks consisting of an assembly of juxtaposed columns in which said unitary stock bins are disposed in superposed relationship, said system comprising essentially:

a central computer for managing and controlling the system and the customers' orders;

at least one automated self-powered handling truck adapted to handle said bins in said storehouse and to pick up articles from the bins of said storehouse and constitute lots of articles and gather said orders, said self-powered truck comprising essentially;

a motorized chassis and translation means for moving said truck along the lanes of said storehouse along said modular racks,

an inboard computer in interactivated relationship with said central computer for managing the movements and stoppages of said truck in said storehouse and controlling its movements,

an inboard store structure consisting of an assembly of columns adapted to receive and hold in superposed relationship a plurality of order receiving bins,

said motorized chassis comprising essentially:

a bin receiving platform adapted to carry at least one stock bin and/or one order receiving bin, said platform being movable at least linearly either in front of said racks of said storehouse or in front of at least one or said columns of said inboard store structure

bin draw-out means adapted alternatively to transfer a unitary bin between said racks of said storehouse and said bin receiving platform, and to transfer an order receiving bin between said inboard store structure and said bin receiving platform,

means for recentering said bin receiving platform so as to accurately position said draw-out means in both abscissa and ordinate in front of a bin disposed in said racks of said storehouse, and

gripping means responsive to said inboard computer and adapted to pick-up one of the articles contained in said stock bin carried by said receiving platform for subsequently depositing said article into said order receiving bin.

4,678,391

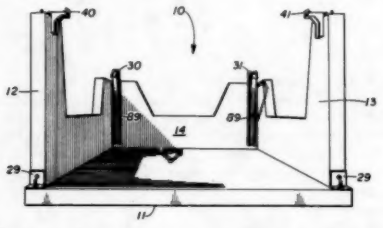
APPARATUS FOR CONVERTING A TRANSFER TRUCK TO A FLATBED OR THE LIKE

Warren M. Mooney, P.O. Box 43, Standard, Calif. 95373

Filed Dec. 11, 1985, Ser. No. 807,751

Int. Cl.[4] B65G *67/02*

U.S. Cl. 414—389 **7 Claims**



1. In an apparatus for converting a transfer truck having a first truck module to a transfer truck ready to receive a second truck module, the invention comprising:

a pair of upstanding spaced side walls;

a rear wall interconnecting the side walls forming a large open area between all of the walls;

a pair of vertically extending brackets mounted on said rear wall, one of said brackets being disposed adjacent the junction of said rear wall with one of said side walls and

the other of said brackets being disposed adjacent the junction of said rear wall with the other of said side walls, each of said brackets having a first upstanding portion secured to said rear wall and a second upper portion extending first horizontally from the upper end of said first upstanding portion then curving downwardly forming a ramp;

a pair of brackets mounted to the upper ends of each of said side walls at the forward ends thereof, each of said brackets including a flat plate secured to the upper surface of its respective side wall adjacent the end thereof remote from said rear wall and an angle flange pivotally secured to each of said flat plates, each of said flanges including a first portion pivotally connected to said flat plate and a second portion extending at generally a right angle to said first portion, one of said flat plates being secured to its respective side wall with its respective flange pivoting from a first position whereby its respective first portion overlies and abuts against said one of said flat plates to a second position whereby said respective first portion extends inwardly of said apparatus and generally coplanar with its respective flat plate, the other of said flat plates being similarly secured to its respective side wall with its respective flange pivoting from a first position whereby its respective first portion overlies and abuts against said one of said flat plates to a second position whereby said last mentioned respective first portion extends inwardly of said apparatus and generally coplanar with its respective flat plate and toward said first portion of said one of said flat plates;

whereby the conversion is accomplished by having a transfer truck, having a truck module thereon which module has rolling means on its underside and a built in hoisting means, backing up into said apparatus to engage the ramps subsequent to the removal of the standard hinge pin that attaches the truck module to the subframe of the transfer truck, such that the rolling means engage the second upper portion and then the first upper portion of the brackets that define the ramps, thus lifting the truck module off its subframe;

the brackets mounted to the upper ends of the side walls of the apparatus, side wall brackets, are pivoted to their respective flat plates;

the truck module is raised up above said side wall brackets using the built in hoist of the transfer truck;

the side wall brackets are pivoted away from their respective flat plates;

the truck module is lowered down using the said hoist, to a position such that the module's front end rests on the side wall brackets thereby permitting the transfer truck, after disconnection of the hoisting means from the truck module, to be driven away forwardly without the truck module.

4,678,392

WHEEL LIFT FOR A TOW TRUCK

Jerry W. Capers, Fort Worth; Donald L. Capers, Saginaw, and Douglas W. Capers, Lakeside, all of Tex., assignors to Hydra-Tech, Inc., Fort Worth, Tex.

Filed Sep. 20, 1985, Ser. No. 778,366
Int. Cl.[4] B60P *3/06*
U.S. Cl. 414—563 **17 Claims**

1. A vehicle wheel lifting apparatus for a tow truck having a frame and a bed mounted thereon, the apparatus comprising in combination:

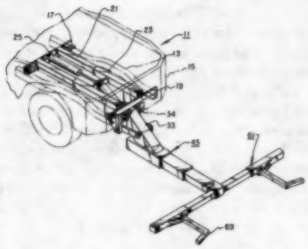
a pair of laterally spaced apart longitudinal rails mounted to the frame under the bed;

a base movably carried on the rails under the bed;

telescoping means, mounted to the base and having a forward end and a lateral member extending laterally in opposite directions from a rearward end, for extending the lateral member in a rearward direction from the bed;

a wheel support mounted on each end of the lateral member for supporting the wheels of a vehicle; and

power means, including a hydraulic cylinder connected between the frame and the base for moving the base longitudinally relative to the frame on the rails between the retracted position wherein a substantial portion of the telescoping means locates under the bed for storage, to an



extended position, wherein a substantial portion of the telescoping means locates rearward of the bed for towing, the base being fully supported by the rails and being located substantially under the bed in both the retracted and extended positions; and

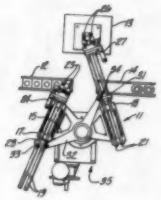
elevating means for raising and lowering the telescoping means relative to the base to selectively lift and lower the wheel supports.

4,678,393

LOADING AND UNLOADING MECHANISM

George Mink, 38296 Horseshoe Dr., Mt. Clemens, Mich. 48043

Continuation of Ser. No. 544,085, Oct. 21, 1983, abandoned.
This application Feb. 24, 1986, Ser. No. 834,114
Int. Cl.[4] B65G *47/52*; F16H *21/54, 25/18*
U.S. Cl. 414—751 **3 Claims**



1. A material transfer device for sequentially moving articles from a first station to a second station and from said second station to a third station comprising a single driven member, motion transfer means for moving said single driven member between a first position and a second position, a supporting member having a pair of arms fixed at a predetermined angular relationship, first gripping means adapted to selectively grip and release an article, second gripping means adapted to selectively grip and release an article, means for supporting said first gripping means upon one arm of said supporting member for linear movement along a reciprocating path from a first position wherein an article at said first station may be gripped and a second position wherein a gripped article may be deposited at said second station, means for supporting said second gripping means upon the other arm of said supporting member for linear movement along a reciprocating path from a first position wherein an article at said second station may be gripped and a second position wherein the gripped article may be deposited at said third station, said paths of movement of said first and

said second gripping means being nonparallel and intersecting, a driving member supported for movement in a first sense with said supporting member along an axis and for rotation relative to said supporting member about said axis, said driving member having a pair of arms fixed relative to each other and each carrying cam means cooperating with follower means on the respective of said gripping means for moving said first gripping means between its first position and its second position and said second gripping means between its first position and its second position in response to relative rotational movement of said driving member relative to said supporting member about said axis from a first angular position to a second angular position, and motion transmitting means for moving said supporting member and said driving member together along said axis from a first axial position to a second axial position and back to its first axial position and for rotating said driving member relative to said supporting member about said axis from its first angular position to its second angular position upon movement of said single driven member between its first position and its second position.

4,678,394

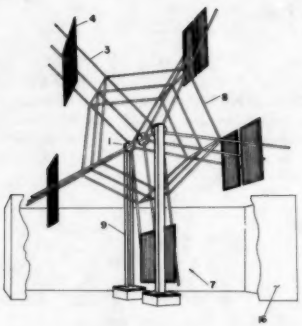
FLUID CURRENT DRIVEN MACHINE EMPLOYING INDIVIDUALLY SELF-GOVERNING ENERGY PANELS

Francis E. Willoughby, Box 689, Pine Bluffs, Wyo. 82082

Filed Jul. 30, 1985, Ser. No. 760,542

Int. Cl.[4] F03D *3/04, 7/06*

U.S. Cl. 415—2 R **4 Claims**



1. A fluid powered traveling shaft machine adapted to be fixed in position within a fluid current and for developing rotational power therefrom, said machine comprising:

(A) a horizontal central rotating axis;

(B) a plurality of sets of support beams extending radially outwardly from said central axis at a corresponding plurality of circumferentially distributed positions thereabout;

1. each said set of support beams comprising at least two parallel support beams;

(C) panel support means carried by each of said support beams at equal radially outward distances from said central axis, said panel support means of a set of support beams cooperating to define a horizontal panel axis of rotation;

(D) at least one rectangular suspended panel rotatably supported by said panel support means in each said panel axis of rotation, said suspended panel having length and width dimensions, said suspended panel being supported by said panel support means at a position intermediate its said length and offset from the center thereof;

(E) adjustable gravity bias means for urging each said suspended panel to rotate about its said panel axis of rotation toward a vertical position in which the center of said length of said panel is disposed below its said panel axis of rotation, said adjustable gravity bias means comprising:

1. discrete added weight means fixed to said suspended panel at the lower end thereof when said suspended panel is in said vertical position; and

(F) a screen shielding at least the lower one-third of the height of said machine from the fluid current.

4,678,395

REGENERATIVE PUMP WITH FORCE EQUALIZATION

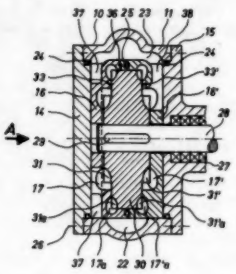
Friedrich Schweinfurter, Bergstrasse 6, 8541 Röttenbach, Fed. Rep. of Germany

Filed Jul. 23, 1985, Ser. No. 758,138

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1984, 3427112

Int. Cl.[4] F04D *5/00*

U.S. Cl. 415—53 T **7 Claims**



1. a regenerative pump comprising

a casing having a casing inlet and a casing outlet,

an impeller provided on a shaft and rotatably disposed within said casing,

at least one blade ring with radially and axially open blade compartments disposed on a first side and on a second side of said impeller,

side channels disposed within said casing and separated from one another by sealing gaps, each of said side channels being provided with an entrance port, an exit port, and an interrupter means, wherein said side channels are arranged with respect to the blade rings so that a conveying medium flows, in two substantially mutually separated conveying streams, through said side channels from a respective side channel entrance to a respective side channel exit, under increasing pressure, characterized in that said entrance ports are connected with said casing inlet, and said exit ports are connected with said casing outlet for subdividing and recombining said conveying streams, wherein said entrance ports, said exit ports, and said interrupters are arranged with respect to said first impeller side in the direction of rotation of said impeller, offset by an angular amount (α) with regard to their corresponding elements on said second impeller side so that the radial forces on said first impeller side, resulting from the pressure differences in said conveying streams between the inlets and outlets, are opposed by equal-size but oppositely directed radial forces on said second impeller side.

4,678,396

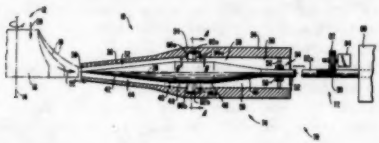
MOVABLE SPIKE, VARIABLE ENTRANCE GEOMETRY PIPE DIFFUSER WITH VIBRATION SUPPRESSION

Rolf J. Mowill, Oslo, Norway, assignor to A S Kongsberg Vapenfabrikk, Kongsberg, Norway

Continuation-in-part of Ser. No. 577,383, Feb. 6, 1984, Pat. No. 4,573,868, which is a division of Ser. No. 438,990, Nov. 4, 1982, Pat. No. 4,549,847. This application Mar. 26, 1985, Ser. No. 716,146

Int. Cl.[4] F04D *29/46*

U.S. Cl. 415—148 13 Claims



1. Diffuser apparatus for use in conjunction with a compressor, the apparatus comprising:

(a) a housing having a diffusion channel with an axis and a cross-sectional flow area smoothly increasing in the flow direction, said housing also having an entrance for receiving gas at a relatively high velocity from the compressor,

(b) means for adjusting the channel flow area, wherein said area adjusting means includes:

(i) a spike member having a contoured axisymmetric face with an axially varying cross-sectional area, said spike being positioned in said channel along the channel axis for presenting said contoured face to oppose the gas flowing in the entrance to said housing, and

(ii) means for slidably positioning said spike member to selectively adjust the flow area of said channel; and

(c) means for constraining said spike member against flow-induced vibrations.

4,678,397

VARIABLE-CAPACITANCE RADIAL TURBINE HAVING SWINGABLE TONGUE MEMBER

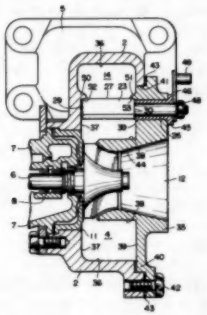
Hiroshi Komatsu, Yokosuka, and Fumio Nishiguchi, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 11, 1984, Ser. No. 619,481

Claims priority, application Japan, Jun. 15, 1983, 58-107248; Sep. 21, 1983, 58-172995; Sep. 21, 1983, 58-145082[U]

Int. Cl.[4] F01B *25/02*

U.S. Cl. 415—151 24 Claims



1. A variable-capacitance radial turbine comprising:

a turbine wheel,

housing means having a wheel chamber enclosing said turbine, a scroll fluid passage which extends from an upstream throat portion to a downstream end portion circumferentially around said turbine wheel and has an aperture for directing a fluid from said scroll passage to the periphery of said turbine wheel in said wheel chamber, a fluid inlet passage for introducing the fluid into said scroll passage, and a fluid outlet for discharging the fluid from said wheel chamber, said scroll passage being bounded radially by a scroll outer peripheral wall facing toward the axis of said turbine wheel, said scroll passage being bounded axially by right and left scroll sidewalls which are axially spaced from each other and confront each other, each of said scroll sidewalls being formed with a seat surface, said seat surfaces of said scroll sidewalls limiting the swing motion of said tongue member by abutting, respectively, on said sealing surfaces of said tongue member when said tongue member is swung to said predetermined position,

a tongue member swingably support on said housing means for varying a sectional area of said throat portion of said scroll passage, and having a width smaller than a distance between said right and left scroll sidewalls said tongue member having two sealing surfaces, said sealing surfaces of said tongue member being, respectively, in contact with said seat surfaces of said sidewalls when said tongue member is in a predetermined position, and;

a swingable tip end positioned on said tongue member and a base end portion having therein a pivot axis about which said tongue member can swing, said pivot axis being substantially parallel to the axis of said turbine wheel and said tip end being swingable toward and away from the axis of said turbine wheel, said tongue member longitudinally extending from said base end portion to said tip end along said scroll passage in a direction of a normal fluid flow in said scroll passage, said sealing surfaces extending substantially over the full longitudinal length of said tongue member on both sides of said tongue member, said seat surfaces extending longitudinally of said scroll passage, each of said sealing surfaces being in contact with the mating seat surface in such a manner that the area of contact therebetween has a width and a length which is substantially equal to the longitudinal length of said tongue member when said tongue member is in said predetermined position.

4,678,398

HIGH EFFICIENCY TRANSONIC MIXED-FLOW COMPRESSOR METHOD AND APPARATUS

John L. Dodge, Phoenix; Duane B. Bush, Tempe; Georges A. Pechuzal, Scottsdale, and Ambrish Ravindranath, Mesa, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 8, 1985, Ser. No. 732,195

Int. Cl.[4] F04D *21/00*

U.S. Cl. 415—181 53 Claims

1. The method of pressurizing elastic fluid to increase the pressure level thereof from a first pressure level to a higher second pressure level; said method comprising the steps of:

(a) forming a first tubular stream of said fluid at said first pressure level and having a longitudinal axis, a first radially inner diameter, a first radially outer diameter, and a first relative velocity vector sum of meridional velocity

and tangential velocity of at least Mach 1.2 with respect to a selected reference at said radially outer diameter;

(b) subdividing said flow stream into a plurality of axially extending and circumferentially spaced apart substreams;

(c) diffusing each of said substreams to a second supersonic relative velocity less than said first relative velocity while limiting deviation of radially outer local relative velocity vectors to no more than 10° with respect to said first relative velocity vector;

(d) passing each of said substreams through a respective normal shock to a third relative velocity of less than Mach 1;

(e) increasing progressively downstream from said normal shock both the radially inner and radially outer diameters of said flow stream as an aggregate of said substreams respectively above said first diameters while further diffusing the relative velocity of each of said substreams to a fourth subsonic relative velocity less than said third relative velocity and increasing the radially outward component of local meridional velocity;

(f) limiting the downstream increase of said outer aggregate diameter to a constant axial rate while decreasing said radially outward component of local meridional velocity and effecting further diffusion of each substream to a fifth subsonic relative velocity less than said fourth relative velocity; and

(g) reuniting said plurality of substreams into a respective second tubular stream of said fluid having a sixth subsonic absolute velocity vector sum of meridional and tangential velocities.

4,678,399

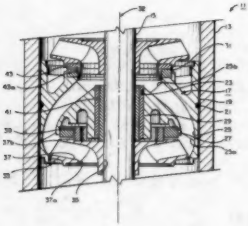
RESISTANT COMPONENTS FOR SUBMERSIBLE PUMP STAGES

Joseph E. Vandevier; John L. Bearden; William F. Pranger, all of Claremore, Okla., and Harold L. Miller, Cary, Ill., assignors to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 585,059, Mar. 1, 1984, abandoned. This application Oct. 23, 1985, Ser. No. 792,618

Int. Cl.[4] F04D *29/62*

U.S. Cl. 415—199.2 **3 Claims**



1. In a submersible centrifugal pump of the type having a housing, a drive shaft extending through the housing, a plurality of diffusers mounted stationarily in the housing, each diffuser having a plurality of passages with a lower inlet and an upper outlet, a plurality of impellers, each mounted to the shaft for rotation therewith, each impeller having a plurality of passages with an inlet for receiving fluid from the outlets of an adjacent lower diffuser and an upper outlet for discharging fluid to the inlets of an adjacent upper diffuser, the improvement comprising:

a tungsten carbide skirt insert secured to a lower side of each impeller surrounding the impeller passage inlet, the skirt insert having a downwardly facing flat surface and a flange portion with a cylindrical outer sidewall and depending downwardly from an inner edge of the flat surface, the skirt insert having an inner sidewall that has an upper edge flush with the impeller passage inlet and a lower edge at the lower end of the flange portion, the inner sidewall extending to the lowermost portion of the impeller passage inlet and defining the outer surface of the impeller passage inlet for reducing erosion of the impeller passage inlet;

a tungsten carbide downward thrust insert secured to an upper side of each diffuser surrounding the diffuser passage outlets, located entirely outward of the depending flange portion of the skirt insert, the downward thrust insert having an upwardly facing flat surface that receives the skirt insert downwardly facing flat surface in sliding contact to transmit downward thrust from the impeller, and an inner sidewall that closely receives the outer sidewall of the flange portion of the skirt insert to provide radial support;

a cylindrical balance ring insert of tungsten carbide secured to an upper side of each impeller; and

a balance ring bore insert of tungsten carbide secured to a lower side of each diffuser, having a cylindrical inner wall that closely receives an outer wall of the balance ring insert to provide radial support.

4,678,400

ROTARY MEANS FOR USE AS A HEAT SOURCE

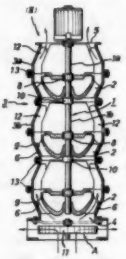
Nobuyoshi Kuboyama, 28-9-1, Shimomiyamori, Aza, Miyamori-Mura, Iwate-ken, Japan

Continuation of Ser. No. 480,706, Mar. 31, 1983, abandoned. This application Dec. 3, 1984, Ser. No. 651,582

Claims priority, application Japan, Apr. 2, 1982, 57-55089

Int. Cl.[4] F04D *29/38*

U.S. Cl. 415—199.4 **7 Claims**



1. Rotary means for use as a heat source in a sealable chamber wherein air pressure within said sealable chamber is reduced or pressurized at a balanced level by discharging air from the chamber or introducing air thereinto, comprising:

a first fan;

said first fan including a first fan vane affixed for rotation upon a first rotary shaft and a first tubular body enclosing said first fan vane;

at least a second fan;

said second fan including a second fan vane affixed for rotation upon a second rotary shaft and a second tubular body enclosing said second fan vane;

means for coupling said first and second rotary shafts together for concerted rotation thereof and of said first and second fan vanes;

means for joining said first and second tubular bodies to form a combined tubular body;

an air discharge opening from said combined tubular body in one of said first and second tubular bodies;

an air suction opening to said combined tubular body in the other of said first and second tubular bodies;

each of said first and second fans including an air friction heat generating means between its fan vane and its tubular body;

means for permitting air friction heat generated by said air

friction heat generating means to be added to said sealable chamber;

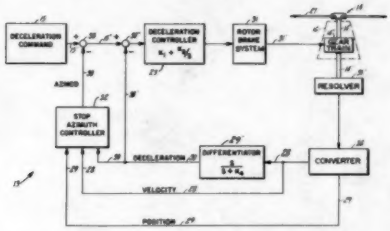
trailing rotary means disposed adjacent one of said air suction opening and said air discharge opening, said trailing rotary means being rotatable by rotation of air at said one of said air suction and said air discharge openings whereby air friction heat is distributed.

4,678,401

ROTOR CONTROL SYSTEM

Michael P. Bradford, Orange, and Joseph R. Maciolek, West Haven, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 24, 1986, Ser. No. 822,353
Int. Cl.[4] B64C *27/24*
U.S. Cl. 416—32 **4 Claims**



1. A control system for slowing the angular velocity and halting the rotary motion of a helicopter rotor at a selected azimuth position with a rotor brake, said rotor including a plurality of blades for rotatably carrying said helicopter, said control system comprising a deceleration controller for controlling the operation of the rotor brake, a deceleration command means for establishing a deceleration command indication for directing the operation of said deceleration controller, a detection means for establishing motion indications of said helicopter rotor, said indications including velocity and position indications, said detection means being responsive to the motion of said helicopter, a feedback means for differentiating said velocity indication to establish a deceleration value of the rotor, and means for reducing said deceleration command indication by the amount of said deceleration value and providing the difference to said deceleration controller, wherein said control system is characterized in that it further comprises means for determining a predicted stop azimuth position of said rotor, and adjustment means for adjustment of the value of said predicted stop azimuth position to a selected stop azimuth.

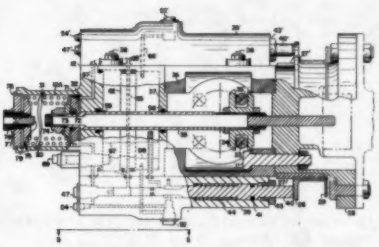
4,678,402

VARIABLE PITCH PROPELLER

Homer D. Roe, 421 Biscayne Dr., Wilmington, N.C. 28405

Filed Sep. 7, 1984, Ser. No. 648,052
Int. Cl.[4] B64C *11/42*
U.S. Cl. 416—157 R **3 Claims**

1. In combination with a propeller including a hub with blades, each mounted for rotatable retention and pitch adjustment in said hub having complete hydraulic system control means with components symmetrically arranged therein for effecting pitch adjustment of said blades with an actuator and connecting means for operably connecting the actuator to the blades, said actuator urgeable by spring biassing means in one direction for adjusting pitch to low blade angles and being subjectable to fluid pressure for movement in the opposite direction against the action of the biassing means for adjusting pitch to high blade angles, said fluid pressure produced by two identical performing reciprocating hydraulic pumps mounted parallel to the hub rotating axis and symmetrically offset thereof, said hub providing attaching means for a propeller shaft adapter on said hub rotating axis for mounting a flanged slidable sleeve keyseated on the adapter preventing relative rotational movement thereon with axial freedom and in equal bearing contact on forward flange face with two hydraulic operating pump plungers, each urged in outward thrust when normally seated by internal pump piston actuating spring biassing force on slidable sleeve stop means or conversely when transmitting incoming operational linear mechanical forces to overcome pump spring set biassed forces which are likewise equally applied to the hydraulic pumps about the hub rotating axis, when such forces are engaged by anti-friction bearing contact on aft slidable sleeve flange surface and in operating contact therewith, also said operational forces acting from a fixed base secured bracket with pivoting lever axis supporting a two-pronged lever, each prong attaching a radial bearing whereby said bearings being located to act horizontally in planes parallel to and symmetrically spaced about the propeller shaft center line and centered in the vertical sense on the propeller shaft center line, said operating force lever when connected to fixed base operating means whereas from the null or



forwardmost position on the pronged operating lever arm exists a positive radial bearing contact clearance as required in the control rigging to prevent unwanted linear forces being transmitted to flange slidable sleeve; however, when powering to control propeller for pitch increase, said power activation is applied by impulses not to exceed the first two-thirds of the pump total stroke displacement to obtain such settings whereby increasing hydraulic pressure on said blade actuator is used for movement against the action of actuator spring biassing means; conversely, reduction of blade pitch angle change is obtained by applying various long impulse strokes which are effective during the final third of total impulse pump stroke displacement limits, whereby pump piston rods in said pump body mechanically activates the pressure unloading valves, thereby reducing hydraulic pressure acting against said biassing spring force means for reducing blade pitch angle change, and inaction of said control impulses at all hydraulic pressure levels conditions all fluid seals in the hydraulic system in the positive static sealing mode to effect blade pitch locking.

4,678,403

LIQUID LEVEL SENSOR FOR CONTROLLING PUMP OPERATION

Richard M. Rudy, 305 Timbercove Cir., Longwood, Fla. 32750, and Thomas J. Fitzgerald, 100 Elizabeth Ave., Altamonte Springs, Fla. 32701

Filed Aug. 1, 1985, Ser. No. 761,532
Int. Cl.[4] F04B *49/00*
U.S. Cl. 417—12 **5 Claims**

1. A control system connected to a voltage supply and to a pump for pumping a liquid, the system comprising:

two probes displaced a distance from each other, which when immersed in the liquid are connected by a conductive path created through the liquid;

a timing means for charging a capacitor when said probes are immersed in a liquid;

a discharging means for discharging said capacitor when said probes are not immersed in a liquid;

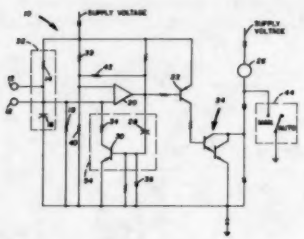
a comparator means for turning "on" when said capacitor is charged to a certain first percentage of supply voltage and for turning from "on" to "off" when said capacitor is discharged to a certain second percentage of supply voltage; and,

a switching means operably coupled to said comparator means and the pump for activating the pump while said comparator means is turned "on";

a reset means, operably coupled to said capacitor and said comparator means, for completely and rapidly discharging said capacitor, said reset means is triggered when said comparator means turns from "on" to "off".

4. A control system connected to a voltage supply and to a pump for pumping a liquid, the system comprising:

two probes displaced a distance from each other, which when immersed in the liquid are connected by a conductive path created through the liquid;



a timing means for charging a capacitor when said probes are immersed in a liquid;

a discharging means for discharging said capacitor when said probes are not immersed in a liquid;

a comparator means for turning "on" when said capacitor is charged to a certain first percentage of supply voltage and for turning from "on" to "off" when said capacitor is discharged to a certain second percentage of supply voltage; and,

a switching means operably coupled to said comparator means and the pump for activating the pump while said comparator means is turned "on" and wherein said two probes are mounted in a package having a triangular cross-sectional portion, said two probes extending from an edge of said triangular cross-sectional portion so that the two faces of said triangular cross-sectional portion slope down from said probes.

4,678,404

LOW VOLUME VARIABLE RPM SUBMERSIBLE WELL PUMP

Jerzy A. Lorett, Beaumaris, Australia, and Joseph E. Vandevier, Claremore, Okla., assignors to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 546,719, Oct. 28, 1983, abandoned. This application Jan. 24, 1986, Ser. No. 822,358

Int. Cl.[4] F04B *49/06*

U.S. Cl. 417—45 **5 Claims**

1. A submersible pump assembly comprising in combination:

a centrifugal pump having impeller means for producing at least two flow rates for a selected head when operated at constant speed, making the pump potentially unstable, and for requiring increasing torque to produce increasing flow rates;

an electric motor connected directly to the pump for driving the pump;

sensing means for sensing the torque output of the motor; and

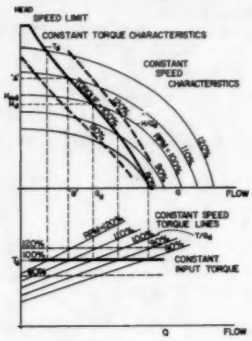
variable speed drive means for varying the speed of the motor in response to the torque sensed by the sensing means to maintain a constant torque output, the constant torque applied to the pump preventing the pump from delivering more than one flow rate for a given head to stabilize the operation.

4. A method of pumping a well with a submersible pump assembly comprising in combination:

providing a centrifugal pump with potentially unstable impellers of a type that will produce at least two flow rates for a selected head;

connecting an AC electric motor directly to the pump for driving the pump;

locating the pump and motor in the well and providing electrical cables that extend to the surface;



connecting the cables to an electrical variable speed drive located at the surface, which is of a type that will vary the speed of the motor by varying the frequency of the electrical power supplied;

sensing the torque output of the motor; and

varying the variable speed drive and thus the speed of the motor to maintain constant torque output of the motor, the constant torque output applied to the pump, preventing the pump from delivering more than one flow rate for a given head, to stabilize the operation.

4,678,405

LOW NET POSITIVE SUCTION HEAD PUMPS

Harvey G. Allen, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 14, 1984, Ser. No. 580,040

Int. Cl.[4] F04D *1/08*

U.S. Cl. 417—245 **8 Claims**

1. Apparatus for pumping a volatile fluid having a given vapor pressure, said pumping apparatus comprising:

(a) a pump housing defining an axis and comprising an inlet for introducing the fluid at a relatively low static pressure level in to said pump housing, an outlet for discharging the fluid from said pump housing at a relatively high static pressure level, and means for defining a fluid path between said inlet and said outlet;

(b) a center post supported within said pump housing about said axis by a plurality of struts, each strut affixed at its inner end to said center post and at its outer end to said pump housing;

(c) a booster state impeller rotatively mounted about said axis within said pump housing adjacent said inlet for drawing the fluid through said inlet and for pumping the fluid along said fluid path with an increased kinetic pressure;

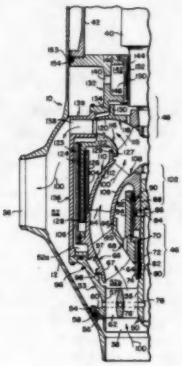
(d) a diffuser affixedly attached to said center post and comprising a plurality of stationary passages disposed to intercept the fluid directed along said fluid path by said booster stage impeller and to direct the fluid substantially along said axis, thus converting the kinetic pressure imparted to

the fluid by said booster stage impeller into increased static pressure;

(e) a pump motor;

(f) a main stage impeller rotatively mounted about said axis within said pump housing and coupled to said pump motor to be rotated at a relatively high speed to impart a relatively high static pressure to the fluid being introduced thereto from said diffuser and for discharging the fluid at a relatively high static pressure; and

(g) hydraulic coupling means disposed remotely from said fluid path for hydraulically coupling said main stage impeller and said booster stage impeller to rotate said booster



stage impeller at a relatively low speed selected to maintain the lowest positive suction pressure applied to the fluid at said inlet greater than said vapor pressure, said hydraulic coupling means comprising a cylindrically shaped drum affixed to said main impeller for rotation about an axis therewith, and a pair of cylindrical members affixed to said booster stage impeller for rotation about said axis, said pair of cylindrical members being spaced from each other for receiving said drum member therebetween, said stationary passages being formed to ensure that the low net positive suction head as established by said main impeller upon the fluid introduced thereto exceeds said vapor pressure.

4,678,406

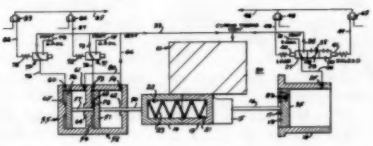
VARIABLE VOLUME RATIO SCREW COMPRESSOR WITH STEP CONTROL

Joseph W. Pillis, Hagerstown, Md.; David A. Murphy, Chambersburg, Pa.; Peter C. Spellar, Hagerstown, Md., and Paul Nemit, Jr., Waynesboro, Pa., assignors to Frick Company, Waynesboro, Pa.

Filed Apr. 25, 1986, Ser. No. 855,676

Int. Cl.[4] F04B *49/02*

U.S. Cl. 417—310 **12 Claims**



1. In a screw compressor having meshing helical rotors on parallel axes and mounted in a housing having intersecting cylindrical bores, a high pressure end wall at one end of said housing and a low pressure end wall at the other end thereof, the low pressure end wall having an inlet opening for the inlet of the compressor and the high pressure end wall having a discharge opening for the outlet of the compressor, an axially extending recess in the housing in open communication with said bores and with the inlet opening, a slide valve member mounted for axial movement in the recess, said slide valve member having an inner face in sealing relationship with said rotors, said slide valve member having a discharge face at one end thereof which is adjacent to the high pressure end wall containing a radial discharge port opening and having a rear face at its other end, and a slide stop member mounted for axial movement in said recess, said slide stop member having an inner face in sealing relationship with said rotors, said slide stop member having a front face, the slide stop front face being adapted to engage the slide valve member rear face to form a continuous composite member which is selectively operative to close the axially extending recess to the inlet opening, said slide valve member and slide stop being movable apart to provide an opening therebetween of variable selected size and axial position in communication with the inlet opening, the improvement comprising,

said slide valve member having first piston means,

said first piston means received in a first cylinder,

high pressure means,

low pressure means,

the outer face of said first piston means communicating with said high pressure means,

first valve means,

first conduit means from said first valve means to said first cylinder,

said first valve means having selective means to connect said conduit means, alternatively, to said high pressure means, to a closed passage, or to said low pressure means,

actuating means for said first valve means, means responsive to the pressure at the inlet opening and operative to control said actuating means,

said slide stop member having second piston means, said second piston means received in a second cylinder having first and second spaced ports on opposite sides of said second piston means,

second valve means,

second conduit means from said second valve means to said first port of said second cylinder,

said second port of said second cylinder communicating with said low pressure means,

said second valve means having selective means to connect said second conduit means, alternatively, to said high pressure means or to said low pressure means,

actuating means for said second valve means, and means responsive to the pressure at the discharge opening and operative to control the actuating means for the second valve means.

4,678,407

MULTI-TANDEM FREE PISTON MACHINE

Henry Benaroya, 41, Bld Commandant Charcot, 92200 Neuilly sur Seine, France

PCT No. PCT/FR80/00097, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981, PCT Pub. No. WO81/00019, PCT Pub. Date Jan. 8, 1981

PCT Filed Jun. 23, 1980, Ser. No. 237,128

Claims priority, application France, Jun. 25, 1979, 79 16295

Int. Cl.[4] F01B *7/02, 1/00*

U.S. Cl. 417—341 **10 Claims**

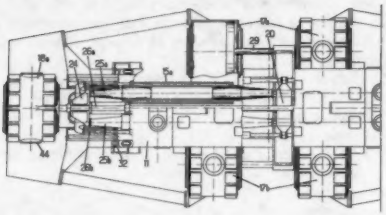
1. Multi-tandem free piston machine, comprising:

a stationary frame having an horizontal longitudinal axis and substantially symmetrical with respect to a vertical midplane, having a lower base member extending substantially throughout the complete length of the frame and an upper header and a central structure secured to said base member and header,

an inner movable unit having a central cross member transverse to said axis and carried by said stationary frame for reciprocation along said axis, two sets of four inner drive

pistons connected to said central cross member, movable in respective drive cylinders whose axes are located at the corners of a rectangle and which are secured to said central structure, said two sets being on opposite sides of said central cross member, and two sets of compressor pistons connected to said central cross member, located on opposite sides of said cross member and slidably received in respective double action inner compressor cylinders whose axes are located outside said rectangle and which are securely connected to said central structure;

an outer movable unit comprising two outer cross members, tie rod means connecting said cross members, a set of four outer drive pistons carried by each said outer cross member and movable in four respective outer drive cylinders,



each said outer cross member being connected to two compressor pistons slidably received in respective double action outer compressor cylinders whose axes are located outside of said rectangle, and which are each located on the longitudinal side of the respective one of said outer cross members opposed to said midplane;

and means for time synchronizing the reciprocations of the two movable units in operation;

the axes of the two compressor pistons of said inner movable unit being in a plane orthogonal to the plane of the axes of the two compressor pistons of said outer movable unit and separated by a distance which is greater than the distance of the axes of the two compressor pistons of said outer movable unit.

4,678,408

SOLENOID DRIVE APPARATUS FOR AN EXTERNAL INFUSION PUMP

Clyde K. Nason, Valencia, and Gordon W. Culp, Van Nuys, both of Calif., assignors to Pacesetter Infusion, Ltd., Sylmar, Calif.

Continuation of Ser. No. 568,615, Jan. 6, 1984. This application Sep. 24, 1985, Ser. No. 779,733

Int. Cl.[4] F04B *9/06, 13/00*

U.S. Cl. 417—410 **11 Claims**

1. A solenoid drive apparatus comprising:

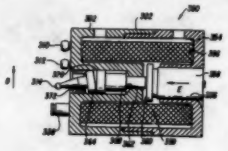
solenoid means responsive to applied electrical energy for moving a solenoid armature in a first linear direction;

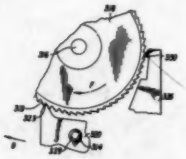
a push rod mechanically linked to said solenoid armature to cause said push rod to be pushed in said first linear direction by the movement of said solenoid armature;

a pawn having a base at one end thereof and a tip at an opposite end thereof, a portion of said base being in contact with said push rod, the movement of said push rod in said first linear direction thereby causing said pawn to rock on said base, thereby causing said tip of said pawn to move in a linear motion in a second direction essentially orthogonal to said first direction;

a pawl mechanically engaged with said tip of said pawn and mounted for slideable movement in said second direction;

a shaft having a longitudinal axis parallel to said first direction, said pawl having one end thereof coupled to the circumference of said shaft whereby the linear motion of said pawl in said second direction translates to rotational motion of said shaft to cause said shaft to rotate; and





means for allowing said shaft to rotate in one direction and for preventing said shaft from rotating in the opposite direction.

4,678,409

MULTIPLE MAGNETIC PUMP SYSTEM

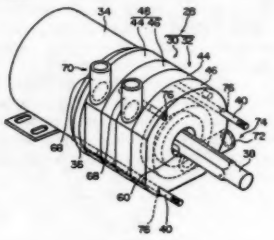
Toshio Kurokawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 21, 1985, Ser. No. 799,770

Claims priority, application Japan, Nov. 22, 1984, 59-178060[U]; Aug. 22, 1985, 60-128151[U]

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—420 **9 Claims**



1. A multiple magnetic pump system comprising:

a single rotatable driving shaft of a driving source;

a plurality of casings each defining a pump chamber; each of said casings comprising a pair of oppositely directed bowl bodies sealably connected to each other at their peripheries to form a pump chamber therebetween, one of said bowl bodies of said pair including an integral tubular member extending from a central portion thereof toward the other bowl body, said other bowl body having a hole at its center and said tubular member at its end remote from the central portion of said one bowl body being sealably coupled to the central portion of said other bowl body at said hole such that said tubular member of said one bowl body and said hole within the center of said other bowl body define a through hole, means for connecting said plurality of casings as an axial array with the through holes for said casings being axially aligned, said tubular member defining an axial through hole therein and partitioning said through hole from said pump chamber so as to allow said driving shaft to be irsertably received within said through holes of said plurality of casings;

at least one driving magnetic material member connected to said driving shaft,

an impeller rotatably mounted on each tubular member in said each pump chamber;

a driven magnetic material member connected to each impeller and receiving a magnetic force from said driving magnetic material member so that said impeller is rotated by a rotation of said driving shaft; and

a pair of inlet and outlet ports provided in each said pump chamber.

4,678,410

HAIR DRYER WITH AXIAL BLOWER

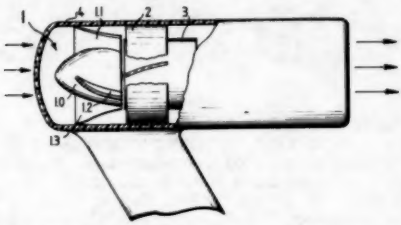
Albrecht Kullen, Wörthsee-Steinbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,424

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3428650

Int. Cl.[4] **F04B** *17/00, 35/04*

U.S. Cl. 417—423 R **7 Claims**



1. A portable, hand-held hair dryer comprising

structure defining an air inlet,

an electric motor,

an axial blower fanwheel mounted on said electric motor,

said fanwheel having hub portion that is a body of rotation and

a plurality of blades disposed on the outside circumference of said hub portion,

the diameter of said hub portion, at least in the axial section where said blades are disposed, increasing constantly in the flow direction in such fashion that its surface is curved convexly in this direction, and

said blades being smoothly curved and further having an entrance angle that increases with radial distance from the rotational axis of said hub, said angle being a function of the average axial flow velocity generated and the circumferential velocity of the fanwheel at the radial distance in question, and all cross sections of said blades perpendicular to the rotational axis of said fanwheel having midlines through the entire radial lengths of said blades, which midlines are straight lines and extensions of which intersect the rotational axis of said hub portion.

4,678,411

OIL PUMP

Dieter Wieland, Remseck, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,180

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447091

Int. Cl.[4] **F04B** *7/06;* **F16N** *13/20;* **F15B** *16/24;* **F16C** *1/10*

U.S. Cl. 417—500 **15 Claims**

1. An oil pump for a motor-driven tool such as for supplying lubricating oil to the cutting chain of a chain saw, the oil pump comprising:

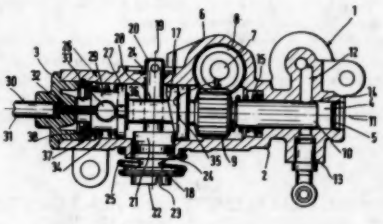
a housing defining a longitudinal housing axis;

a piston defining a longitudinal piston axis coincident with said longitudinal housing axis and being mounted in said housing so as to be displaceable along and rotatable about said axis;

drive means for rotatably driving said piston about said axis;

control cam means for reciprocably displacing said piston through a predetermined stroke along said axis as said piston is rotated about said axis;

a control slider slideably mounted in said housing for movement between a first position whereat said control slider limits the movement of said piston to a portion of said stroke thereby causing said piston to pump the lubricating oil at a first rate and a second position whereat said piston is free to move through the full excursion of said stroke thereby causing said piston to pump the lubricating oil at a second rate greater than said first rate;



actuator means for actuating said control slider for moving the same against the force of said slider spring from said first position to said second position, said actuator means including a manually actuated Bowden cable connected to said control slider;

said control slider having a projection extending outwardly therefrom in a direction away from said piston and along said housing axis, said housing being an elongated structure having a cover disposed at one end thereof adjacent said projection, said Bowden cable including a pull wire anchored in said projection and a casing surrounding said pull wire, said casing being supported on said cover.

4,678,412

ADJUSTING APPARATUS FOR A VANE PUMP OR RADIAL PISTON PUMP

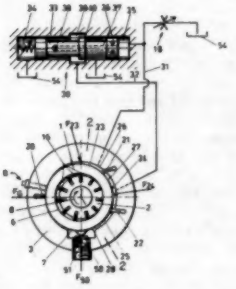
Jorg Dantlgraber, Lohr-Sackenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth G.m.b.H., Lohr, Fed. Rep. of Germany

Continuation of Ser. No. 564,956, Dec. 23, 1983, abandoned. This application Feb. 21, 1986, Ser. No. 833,511

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247885

Int. Cl.[4] **F04C** *2/344, 15/04;* **F04B** *49/08*

U.S. Cl. 418—26 **32 Claims**

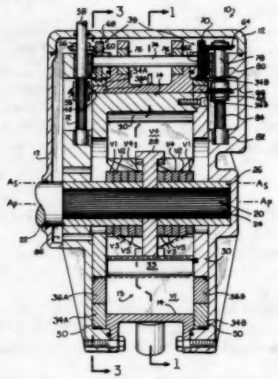


1. A pump for the conveyance of hydraulic operating fluid comprising:

a housing;

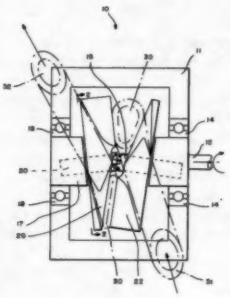
a rotor mounted rotatably in said housing;
a plurality of pumping means carried by said rotor;
an adjustable cam ring movable in two directions orthogonal to each other having an inside and an outside jacket and being disposed to surround said rotor;
said cam ring being subjected to an operating force F_A, said operating force being generated by system pressure outwardly on said cam ring;
first support means for supporting said cam ring in different positions, which correspond to different amounts of fluid being conveyed, by means of the hydraulic operating fluid acting directly onto said outside jacket of said cam ring at a pump regulating pressure, said pump regulating pressure being derived from the system pressure and being applied in a first direction for moving the cam ring into different positions along the first direction; and
second support means for supporting said cam ring and for providing adjustment of the start of compression depending on the system pressure by means of the hydraulic operating fluid acting directly onto said outside jacket of said cam ring in a second direction which is substantially orthogonal to said first direction.

4,678,413
VARIABLE DISPLACEMENT VANE PUMP OR MOTOR
Edward Ries, 450 Porter La., San Jose, Calif. 95127
Filed Jan. 22, 1986, Ser. No. 821,485
Int. Cl.[4] F01C *21/16*; F04C *15/04*
U.S. Cl. 418—29 **4 Claims**



1. A variable displacement machine comprising:
a housing provided with a chamber having a substantially cylindrical surface and a pair of orifices opening on said chamber;
rotary shaft means extending into said housing and having a primary axis of rotation;
a plurality of vane means having first ends coupled to said shaft means for rotation therewith, said vane means extending substantially radially from said shaft means, said vane means having second ends which sweep along said substantially cylindrical surface as said shaft means rotates;
rotor means disposed within said chamber around said shaft means and within said cylindrical surface, said rotor means having a secondary axis of rotation which is substantially parallel to said primary axis of rotation, said rotor means being provided with a plurality of apertures, where said vane means extend through said plurality of apertures such that said rotor means rotates with said vane means and said shaft means; and
an adjustment means for adjusting the position of said rotor means relative to said primary axis, said adjustment means including an outer eccentric member, an inner eccentric member and having a means for rotating said eccentric members in counter-rotating directions, said outer member having a first outer surface in engagement with the cylindrical surface of said chamber and having a first inner surface which is eccentric relative to said first outer surface, said inner member having a second outer surface in engagement with said first inner surface and having a second inner surface in engagement with said rotor means, said second inner surface being eccentric said second outer surface.

4,678,414
PERISTALTIC DIAPHRAGM PUMP WITH CONICALLY SHAPED NUTATING MEMBERS
Charles Raymond, Jr., 312 Sixth St., Petaluma, Calif. 94952
Filed Dec. 8, 1986, Ser. No. 938,833
Int. Cl.[4] F01C *5/00*
U.S. Cl. 418—45 **7 Claims**

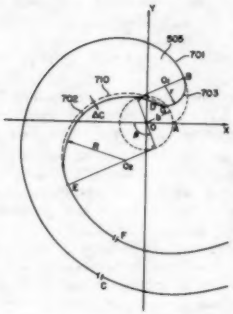


1. A peristaltic diaphragm pump comprising
a drive shaft defining an axis of rotation,
a first nutating member having a first contact surface,
a second nutating member having a second contact surface,
means for mounting said first and second members for nutating movement with respect to said axis of rotation and with said contact surfaces in mutually facing relationship, and
a flexible tubular member having an inlet and an outlet at ends thereof, said tubular member disposed between said first and second contact surfaces and around said axis of rotation,
each of said contact surfaces being nearly conical with the slope linearly changing from a minimum angle to a maximum angle around an oblique axis with respect to said axis of rotation such that each of said nutating members nutates with respect to said axis of rotation to compress said tubular member peristaltically between said contact surfaces and to provide a linear radial sealing on said tubular member as said drive shaft is rotated around said axis of rotation.

4,678,415
ROTARY TYPE FLUID MACHINE

Takahisa Hirano, and Kiyoshi Hagimoto, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed May 24, 1985, Ser. No. 738,049
Claims priority, application Japan, May 25, 1984, 59-105970; May 28, 1984, 59-108008; May 31, 1984, 59-111658
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[4] F01C *1/02*
U.S. Cl. 418—50 3 Claims



1. A rotary type fluid machine comprising stationary spiral means and revolving spiral means respectively having a substantially identical configuration and disposed 180 degrees apart from each other in mutually nested relationship, said revolving spiral means being adapted to revolve in solar motion relationship with said stationary spiral means with a radius ρ or revolutionary motion wherein said both spiral means are respectively formed by an outer curve consisting of an involute curve, an inner curve consisting of an involute curve having an inner arc of a radius R, and a connection curve having an arc of a radius r and connecting said outer curve and said arc having the radius R in a smooth manner so that fluid can be sucked into and delivered out of the fluid machine, characterized in that said both spiral means are respectively formed in accordance with the following equations; i.e.,

$$R=\rho+b\beta+d$$

$$r=b\beta+d$$

$$d=\frac{b^2-\left(\frac{\rho}{2}+b\beta\right)^2}{2\left(\frac{\rho}{2}+b\beta\right)}$$

wherein

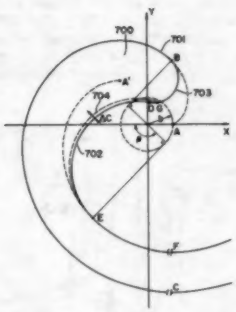
$$\beta \geqq \frac{\pi+\sqrt{\pi^2-4}}{2}-\frac{\rho}{2b}$$

and b is the radius of a base circle of said involute curve.

4,678,416
ROTARY TYPE FLUID MACHINE

Takahisa Hirano; Shoji Fukami, and Mitsutosho Maeda, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed May 24, 1985, Ser. No. 738,094
Claims priority, application Japan, May 25, 1984, 59-105971
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[4] F01C *1/04*
U.S. Cl. 418—55 1 Claim



1. A rotary type fluid machine comprising stationary spiral means and revolving spiral means respectively having a substantially identical configuration and disposed 180 degrees apart from each other in mutually nested relationship, said revolving spiral means being adapted to resolve in solar motion relationship with respect to said stationary spiral means with a radius of revolutionary motion ρ, wherein said both spiral means are respectively formed by an outer curve consisting of an involute curve, an inner curve consisting of another involute curve having an inner arc of radius R, and an arc of a radius r connecting smoothly said outer curve and said arc having the radius R, in accordance with the geometrical relationship as given by the following equations;

$$R=\rho+b\beta+d$$
$$r=b\beta+d$$

$$d=\frac{b^2-\left(\frac{\rho}{2}+b\beta\right)^2}{2\left(\frac{\rho}{2}+b\beta\right)}$$

where,
$\beta \geqq 135°$, and
b is the radius of a base circle of said involute curve.

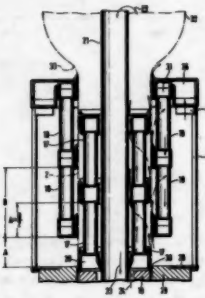
4,678,417
APPARATUS FOR COOLING TUBULAR PLASTIC FILM EXTRUDED FROM A FILM BLOWING HEAD

Hartmut Upmeier, Lengerich of Westphalia, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengrich, Fed. Rep. of Germany

Continuation of Ser. No. 594,910, Mar. 29, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 857,390
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311932; Sep. 15, 1983, 3333397
Int. Cl.[4] B29C *47/36*
U.S. Cl. 425—72 R 13 Claims

1. Cooling apparatus for air-cooling tubular plastic film which has been extruded from a film blowing head including an annular extrusion die, which apparatus comprises: axially

spaced successive cooling rings, which in the direction of extrusion are downstream of the annular extrusion die of the film blowing head and are substantially concentric to a longitudinal axis of the extruded tubular film, the cooling rings including first rings having first convex annular air-guiding surfaces adjacent to and facing a surface of the tubular film and defining an annular flow passage with the film for conveying cooling air which flows in contact with said air-guiding surfaces and with the film, the air-guiding surfaces being convexly curved along substantially their entire length in a longitudinal sectional view of the first rings to define with the surface of the film an annular flow passage that converges and then diverges in an axial direction, and nozzle gaps defined by second rings positioned upstream of and spaced from the first rings and which are so arranged that a main cooling air flow discharged from said nozzle gaps flows into the converging portion of said annular



flow passage along the convexly curved air-guiding surfaces of said first rings and along the surface of the tubular film and approximately parallel to and in the same direction as the direction of travel of the tubular film, said nozzle gaps positioned at an outlet of a converging annular passageway defined by said first and second rings, said second rings having second convex annular air-guiding surfaces adjacent to and facing the surface of the film and over which an induced flow of ambient air passes as a result of an injection effect to provide additional cooling air that flows in the same direction as the direction of travel of the tubular film, and said first rings having an annular trailing edge defined by the junction of said first annular air-guiding surface and a second surface of said first ring over which an additional flow of ambient air is induced by the main cooling air flow to flow in the direction of travel of the tubular film.

4,678,418

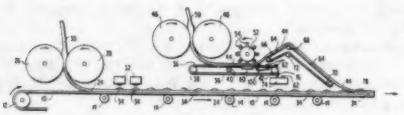
APPARATUS FOR CONTINUOUSLY FORMING LATTICED PASTRY GOODS

Robert R. Thulin, Wyckoff, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 743,380, Jun. 11, 1985. This application Oct. 28, 1985, Ser. No. 792,024

Int. Cl.[4] A21C *11/12*

U.S. Cl. 425—115 **9 Claims**



1. Apparatus for continuously forming individual product pieces having filler therein and having perforations of substantial size in the top layer thereof, comprising:

(a) means for forming a first continuous flat dough sheet;

(b) means for transporting the first continuous flat dough sheet;

(c) means for periodically depositing at least one portion of a natural filler or an artificial filler on the first continuous flat dough sheet;

(d) means for forming a second continuous flat dough sheet;

(e) conveyor belt means for transporting the second continuous flat dough sheet, the conveyor belt means having a conveyor belt of a material to which the dough of the second continuous flat dough sheet will adhere in response to pressure, the conveyor belt means being positioned above said transporting means along the axis of movement thereof after the filler depositing means;

(f) means for moving cutting elements through the second continuous flat dough sheet to form a multitude of holes in the second continuous flat dough sheet, each such hole containing a dough piece therein, the cutting elements pressing the perimeter of each dough piece so that the perimeter of each dough piece adheres to said conveyor belt means;

(g) means for lifting the second continuous flat dough sheet off said conveyor belt means without disturbing the cut out dough pieces, adhered to said conveyor belt thereby providing perforations in the second continuous flat dough sheet, the lifting means being positioned above the end portion of said conveyor belt means along the axis of movement of said conveyor belt means and above said transporting means;

(h) means for placing the perforated, second continuous flat dough sheet on top of the first continuous flat dough sheet and deposits of filler thereon, thereby forming a continuous composite comprising the filler deposits enclosed between the perforated, second continuous dough sheet and the first continuous flat dough sheet; and

(i) means for dividing the continuous composite into indivdual pieces, each individual piece having at least one deposit of filler enclosed between a segment of the perforated, second dough sheet and a segment of the first flat dough sheet.

4,678,419

ARRANGEMENT FOR THE PRODUCTION OF VITRIFIED SLAG

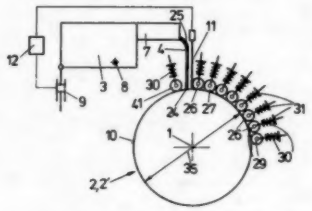
Bernhard Enkner; Dietmar Stephani; Leopold Schropp, all of Linz, and Wilhelm Stastny, Alberndorf, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Mar. 3, 1986, Ser. No. 835,160

Claims priority, application Austria, Mar. 15, 1985, 775/85

Int. Cl.[4] B28B *17/00*

U.S. Cl. 425—143 **28 Claims**



1. An arrangement for the production of vitrified slag, such as blast furnace slag, including a rotating cooling drum provided with an internal cooling and recesses on its surface adapted to receive molten slag impinging on said cooling drum on a site of impact located on said cooling drum approximately in its uppermost point, the improvement which comprises cooling drum webs for separating said recesses in the circumferential direction of said cooling drum, said recesses being closed in the end regions of said cooling drum in the axial

direction thereof, and a plurality of cooled counter rolls contacting said cooling drum webs by their surfaces and aligned with their axes parallel to the axis of said cooling drum, said counter rolls being arranged after said site of impact of said slag in the rotation direction of said cooling drum and one behind the other in the circumferential direction of said cooling drum.

4,678,420

INJECTION MOLDING MACHINE WITH AUXILIARY PACKING MEANS

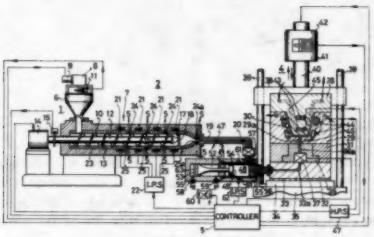
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawaken, Japan

Filed Feb. 5, 1985, Ser. No. 698,419

Claims priority, application Japan, Feb. 6, 1984, 59-18488; Oct. 9, 1984, 59-210378

Int. Cl.⁴ B29C *45/77, 45/78*

U.S. Cl. 425—144 **6 Claims**



1. An injection molding machine for molding a plastic material, comprising:

barrel means for melting the plastic material and for extruding a melt of the plastic material, said barrel means having two ends;

a heated cylinder within said barrel means for containing the plastic material, said cylinder having a screwed ram rotationally disposed therein;

a feeder for dispensing the plastic material into the heated cylinder, said feeder mounted on one end of said barrel means;

an outlet nozzle for extruding the plastic melt from said heated cylinder, said outlet nozzle located at the other end of said barrel means;

packing means for accepting an amount of said extruded plastic melt from said outlet nozzle, said packing means having a heated tubular housing;

a sliding member disposed in said tubular housing for sliding displacement, said sliding member and said tubular housing forming a packing chamber for accepting said plastic melt;

a mold cavity coupled to said packing means;

drive means associated with said packing means for displacing said sliding member to reduce the volume of said packing chamber for forcing the plastic melt contained in said packing chamber into said molding cavity;

control means for controlling the rotation rate of said screwed ram, the plastic material dispensing rate of said feeder, and the temperature of said heated cylinder;

a plurality of pressure sensors disposed along the length of said heated cylinder for sensing pressures along the interior length of the heated cylinder, said pressure sensors being electrically coupled to said control means to supply said control means with signals respecting the pressure profile along the interior length of said heated cylinder;

a plurality of temperature sensors disposed along the length of the interior of the heated cylinder for sensing temperatures along the interior length of the heated cylinder, said temperature sensors being electrically coupled to said control means to supply said control means with signals respecting the temperature profile along the interior length of said cylinder; and

said control means being such as to regulate the rotation rate of said screwed ram, the plastic material feed rate of said feeder and the temperature of said heated cylinder in response to said sensed pressure and temperature profiles.

4,678,421

RESIN MOLDING APPARATUS

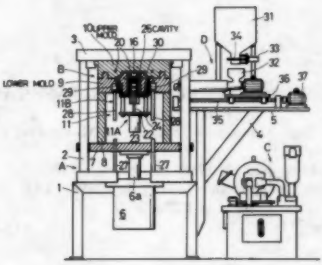
Toru Kai, Inazawa, and Kouichi Kato, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Nov. 25, 1985, Ser. No. 801,403

Claims priority, application Japan, Nov. 26, 1984, 59-248860

Int. Cl.⁴ B29C *45/03, 45/07*

U.S. Cl. 425—159 **4 Claims**



1. A resin molding apparatus comprising;

a frame member;

an upper mold secured to said frame member;

a lower mold mounted for up and down movement relative to said upper mold, said lower mold having a lifted position in which said lower mold is abutted with said upper mold and defines a mold cavity therewith;

a pouring pot means disposed within said lower mold said pouring pot means including a pot with a heating member provided therein and a piston member disposed for up and down movement within said pot and having a lifted position in which said piston defines part of said cavity; and

a material supply unit mounted on said frame member for back and forth movement between said upper and lower molds when said lower mold is at a lowered position thereof,

said material supply unit including:

a plasticizing cylinder for plasticizing a resin material,

a supply plunger for supplying the resin material into said pot of said pouring pot means,

a drive device provided for individually driving said plasticizing cylinder and said supply plunger, and

a ball screw member for moving said plasticizing cylinder, said supply plunger and said drive device back and forth as a unit.

4,678,422

SYSTEMS AND METHODS FOR PRECISE, ACCURATE FORMATION OF PRODUCTS BY PHOTOABLATION

Kenneth K. York, Apt. No. 28, 1633 Amberwood Dr., Pasadena, Calif. 91030

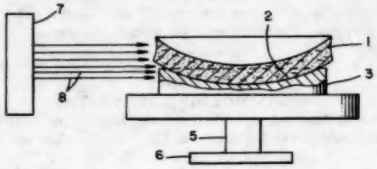
Filed Nov. 12, 1985, Ser. No. 797,228

Int. Cl.⁴ B25B *17/00*

U.S. Cl. 425—174.4 **7 Claims**

1. A system for shaping a moldable photoablatable product blank into a finished product comprising mold means for holding a moldable photoablatable product blank, said mold means having an interior surface of predetermined size and shape, said mold means being substantially impervious to photoablating light; means for generating light capable of photoablating said

product blank; and means for directing light capable of photoablating said product blank across and against the opening of



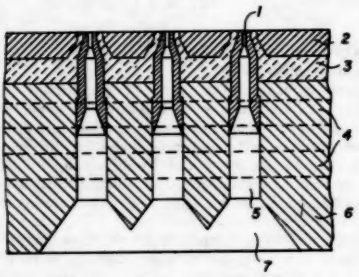
said mold means to photoablate the portions of the product blank projecting from said opening without affecting the product blank inside the mold.

4,678,423

DIE FOR HOT DIE FACE CUTTING THERMOPLASTIC POLYMERS

Franco Bertolotti, Milan, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Jan. 31, 1985, Ser. No. 696,740
Claims priority, application Italy, Feb. 2, 1984, 19387 A/84
Int. Cl.[4] B29B *9/00*
U.S. Cl. 425—311 14 Claims



1. A die for hot die face cutting thermoplastic polymers, comprising:

a die body comprising a plurality of channels for polymer flow;

a bored plate fixed to a front part of said die body and bored at locations corresponding to each channel, said bored plate having an outer surface acting as a cutting counterblade and an inner surface;

a layer of insulating material positioned between the die body and the bored plate;

said die body comprising a thermoregulating system for thermally regulating the die body at least an end part of said channels; and

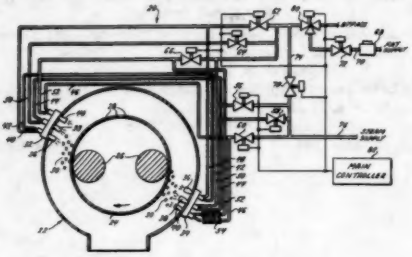
a plurality of nozzles, each nozzle being (i) rooted inside the die body at each location corresponding to said channels, (ii) protruding from the die body, and (iii) extending through the insulating layer and the bored plate, said insulating material closely fitting around an external configuration of respective end parts of said nozzles and to said inner surface and bored locations of said plate, wherein said insulating material envelopes said nozzles up to said end parts of said nozzles such that said nozzles do not contact said bored plate at any point, and said nozzles being made of a metal material having thermal conductivity higher than 60 W/m°k.

4,678,424

CONTROLLED FAT INJECTION WITH STEAM IN A PELLET MILL

Joseph A. Volk, Jr., Florissant, and Mark R. Kniepmann, St. Louis, both of Mo., assignors to Beta Raven Inc., Hazelwood, Mo.

Filed Jul. 15, 1985, Ser. No. 755,082
Int. Cl.[4] A23P *1/02, 1/08*
U.S. Cl. 425—331 20 Claims



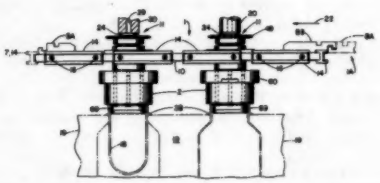
1. In a pellet mill for processing a mash into pellets, said mill including a die, the die having a plurality of holes and at least one roller mounted inside the die and positioned substantially adjacent the die so that as the die and roller rotate, the roller squeezes the mash through the die holes to form pellets, the improvement comprising means to mix liquid fat with steam and spray the pellets with said heated fat mixture immediately after they are formed upon exiting through the die holes.

4,678,425

RESILIENT SKIRTED SPINDLE NOSE AND PALLET WITH RECIPROCATABLE SPINDLE COMBINED THEREWITH

Joseph F. Gibbemeyer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 27, 1986, Ser. No. 900,947
Int. Cl.[4] B29C *49/28*
U.S. Cl. 425—522 19 Claims



1. A spindle nose for use in manufacturing or blow molding hollow plastic products from a hollow workpiece having a finish the inside diameter of which is engaged by a portion of the spindle nose, said spindle nose comprising:

a base; a locating stud extending from one side of said base; a flexible annular skirt extending from the other side of said base, said skirt being sufficiently resilient to maintain sealing engagement with the inside diameter of the workpiece finish during blow molding; and an air passage extending completely through said locating stud, base, and flexible skirt.

9. An improved pallet assembly for use in a blow molding machine that uses a blow fluid, said assembly having an exchangeable chuck and permitting relative axial motion between the spindle and the pallet baseplate, said assembly comprising:

a generally rectangular pallet baseplate;

a plurality of spindle assemblies extending through and mounted in the baseplate;

each spindle assembly having bearing means, a hollow spindle shaft with a passage therethrough mounted in said bearing means for rotation and axial reciprocation relative to a shaft axis and said baseplate, a shaft base at the bottom of said shaft, a reset means to urge said shaft to its beginning position after lineal movement, and a locating and seal recess within said shaft base and surrounding the passage at bottom end of said spindle shaft; and

a spindle nose mounted on said shaft base for use in manufacturing or blow molding hollow plastic products from a hollow workpiece having a finish the inside diameter of which is engaged by a portion of the spindle nose, which portion further comprises:

a nose base; a locating stud extending from one side of said nose base into said locating recess; a flexible skirt extending from the other side of said nose base, said skirt being sufficiently resilient to maintain sealing engagement with the inside diameter of the workpiece finish during blow molding; and a second air passage connected to the first said passage and extending through said locating stud, nose base, and flexible skirt.

4,678,426

TRANSFER NOZZLE IN A HOT RUNNER TOOL

Bernard Stauber, Hirschenplatz 146, CH-8460 Marthalen, Switzerland

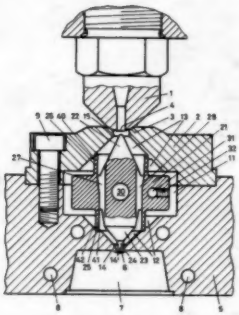
PCT No. PCT/CH85/00015, § 371 Date Sep. 30, 1985, § 102(e) Date Sep. 30, 1985, PCT Pub. No. WO85/03476, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 1, 1985, Ser. No. 786,958

Claims priority, application Switzerland, Feb. 6, 1984, 558/84

Int. Cl.[4] B29C *45/20, 33/02*

U.S. Cl. 425—549 **9 Claims**



1. Hot channel injector arrangement of a hot channel plastic injection molding machine having a machine supply nozzle and a mold cavity, comprising

A hot channel injector having an internnal wall defining an axial transfer chamber provided with a receiving end and a delivery end in axially opposed relation, a receiving entrance at the receiving end for receiving plastic from a supply nozzle of the machine and a delivery exit at the delivery end provided with a nozzle mouth opening directly into a mold cavity of the machine for delivering hot plastic thereto, and

An axial nozzle body in the chamber and having a heatable intermediate disc portion provided with a receiving side and a delivery side in axially opposed relation and containing a heating element accommodating intermediate radial passage bore therein, an axial sprue cone on the receiving side, an axial nozzle conical tip on the delivery side, an axial cone sleeve collar on the receiving side and having an outer free end, said cone collar being outwardly spaced from and surounding the cone along at least a part of the axial extent of the cone, an axial tip sleeve collar on the delivery side and having an outer free end, said tip collar being outwardly spaced from and surrounding the tip along at least a portion of the axial extent of the tip, and a plurality of axial flow passages for injected plastic annularly distributed in the disc portion for communicating the space between said cone collar and cone on the receiving side with the space between said tip collar and tip on the delivery side,

The nozzle body being arranged in spaced relation to the internal wall defining the chamber with the cone adjacent yet spaced from the chamber entrance and the tip adjacent the mouth of the chamber exit, and being mounted in the chamber by positioning engagement of said cone collar free end and said tip collar free and with corresponding adjacent portions of the internal wall defining the chamber.

4,678,427

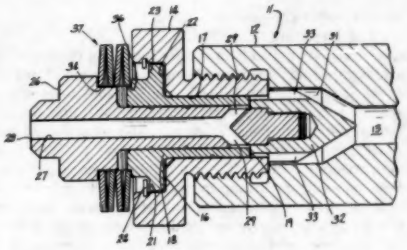
AUTOMATIC SHUT OFF NOZZLE FOR PLASTIC EXTRUDER

Klaus Fritzsche, Allistom, Canada, assignor to Husky Injection Molding System Ltd., Bolton, Canada

Filed Nov. 4, 1985, Ser. No. 794,287

Int. Cl.[4] B29C *45/22*

U.S. Cl. 425—562 **11 Claims**



1. A multi-position nozzle assembly for an injection molding machine operable to assume three distinct positions, namely a fully closed position, a partially open purging position and a fully open molding position, said nozzle assembly comprising:

a housing having an internal compound transmission channel, a housing extension connected to said housing, a sleeve member received slidably in said housing extension, stop means on said housing extension for limiting relative axial motion between the sleeve member and the housing extension and for establishing the partially open purging position, a torpedo having a central through bore slidably disposed in said sleeve member, said central through bore having an inlet port and an outlet end said inlet port being operable to connect with said transmission channel, cap means carried by said torpedo for effecting operating contact with said sleeve member, and a single power means operating continuously and directly on said torpedo and on the sleeve member, said power means tending to urge the torpedo relative to the sleeve member to maintain contact between said sleeve member and said cap means whereby said sleeve member overlays and closes said inlet port to establish said fully closed position while maintaining a predetermined axially spaced condition between the torpedo and the sleeve member.

4,678,428

MULTISTAGE FUEL BURNER HAVING A HELICALLY RISING COLUMN OF AIR-FUEL MIXTURE

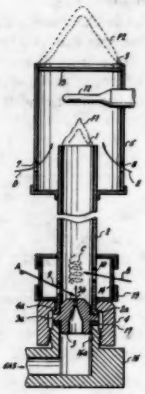
Eiichi Tanaka, Yamatokoriyama; Koro Furumai, Ikoma, and Fumitaka Kikutani, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 6, 1986, Ser. No. 816,630

Claims priority, application Japan, Jan. 10, 1985, 60-2325; Jun. 20, 1985, 60-134517

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—76 **7 Claims**



1. A fuel burner comprising:

a nozzle for ejecting fuel;

an inner tube having an inlet end for receiving the fuel from said nozzle, said inner tube having first and second air inlet ports adjacent to said nozzle and located in positions spaced longitudinally apart sequentially in the downstream direction of said inner tube and spaced angularly apart from said axis;

means, coacting with said inner tube, for directing a first air flow into said inner tube through said first air inlet port with a velocity component in the upstream direction toward said fuel nozzle and for directing a second air flow into said inner tube through said second air inlet port with a velocity component in the downstream direction away from said nozzle to thereby produce a helically rising column of mixture of fuel and oxygen and providing primary combustion of the mixture at an outlet end thereof, said inner tube having no other air inlet ports upstream of said second air inlet port;

an outer tube surrounding and coaxial with the inner tube, the outer tube having secondary air inlet ports for introducing secondary air into the outer tube to provide secondary combustion at an outlet end thereof; and

a sensor located between the outlet ends of said inner and outer tubes for detecting the presence of said primary combustion.

4,678,429

DIE CASTING TORCH

Kenneth P. Zecman, P.O. Box 39009, Redford, Mich. 48239

Filed Sep. 12, 1985, Ser. No. 775,146

Int. Cl.[4] F23Q *25/00*

U.S. Cl. 431—144 **12 Claims**

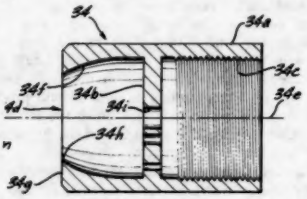
11. An apparatus for limiting the temperature of the heat delivered to a nozzle of a die casting apparatus to avoid damaging the nozzle and avoid heating of the die cast metal above the temperature required for smooth flow, said apparatus comprising:

(A) a torch directed at the nozzle;

(B) a supply of pressurized air;

(C) a supply of a pressurized combustible gas;

(D) means for delivering said air and said gas to said torch in varying ratios of air pressure to gas pressure so that said air and said gas may be ignited to form a flame emitting from said torch for heating said nozzle; and



(E) means operative to extinguish said flame in response to an increase in said pressure ratio beyond a predetermined value;

(F) said torch including an elongated tubular torch tip having a transverse partition between its ends; and

(G) extinguishing means comprising means defining a mouth at the discharge end of said tip having a diameter that is less than the inner diameter of said tip at said partition.

4,678,430

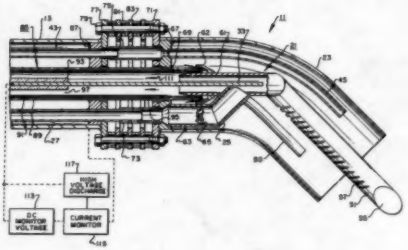
IGNITER FOR GAS DISCHARGE PIPE WITH A FLAME DETECTION SYSTEM

Romeo E. Guerra, 6118 Walnut Hill La., Dallas, Tex. 75234

Division of Ser. No. 743,428, Jun. 11, 1985, Pat. No. 4,595,354. This application May 5, 1986, Ser. No. 859,363

Int. Cl.[4] F23D *13/20*

U.S. Cl. 431—202 **4 Claims**



1. An improved igniter for a gas discharge pipe, comprising in combination:

a tubular housing adapted to be mounted to the pipe;

a nozzle secured to the upper end of the housing, having a laterally extending tip for discharging flame across the opening of the discharge pipe, the nozzle having a central conduit connected to the tip, a gas conduit connected to the central conduit, each conduit having a downwardly facing opening;

a stop member located in the upper end of the housing below the nozzle;

a frame extending through the housing, having an upper end adapted to engage the stop member;

an electrode mounted to the frame for insertion into the opening of the central conduit when the frame engages the stop member;

a gas line carried by the frame, having a lower end adapted to be connected to a source of gaseous fuel and an upper end that is adapted to telescopingly insert into the gas conduit to deliver fuel to the nozzle;

an electrical power means for providing voltage to the electrode to create a spark to ignite the fuel;

a brace;

mounting means for releasably securing the brace in the housing below the frame; and

compression means mounted to the brace for pressing against the frame to push it tightly against the stop member, allowing the frame and electrode to be removed for maintenance by removing the brace.

4,678,431

VAPORIZATION BURNER FOR A HEATER OPERATED BY MEANS OF LIQUID FUEL

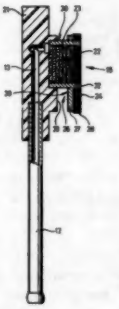
Friedrich Widemann, Munich, and Dieter Goerlich, Emmering, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,813

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504291; Oct. 26, 1985, 3538201

Int. Cl.[4] F23B *3/40*

U.S. Cl. 431—328 **20 Claims**



1. A vaporization burner for a heater operated by means of liquid fuel, particularly, a heater for vehicles, having an absorbent body to which fuel is supplied via fuel feeding device and which projects into a combustion chamber of the heater, wherein the absorbent body comprises a first vaporization part for very volatile fuel components and into which the fuel feeding device leads, and a second vaporization part for the least volatile fuel components located at an end of the absorbent body facing the combustion chamber, the two vaporization parts being separated from one another in an essentially fuel-impermeable way.

4,678,432

HEAT TREATMENT METHOD

Hideyuki Teraoka, Hikone, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Sep. 5, 1985, Ser. No. 772,780

Claims priority, application Japan, Nov. 26, 1984, 59-248889

Int. Cl.[4] F27D *13/00*

U.S. Cl. 432—12 **4 Claims**

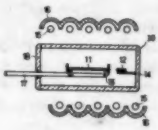
1. In a method for heat treating an object wherein the object is carried into a heating furnace and is heat-treated by irradiation with light which is emitted from a light source disposed facing at least one side of said object in accordance with an output program which calls for a rise in temperature followed by a decrease in temperature, the improvement comprising:

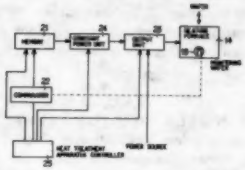
(a) preheating the furnace prior to carrying the object into the furnace by irradiating the furnace with light in accordance with the output program;

(b) measuring a first elapsed time between a first time when a first set-up temperature is reached in the course of the rise of furnace temperature, and a second time when a second set-up temperature is reached in the course of the decrease in furnace temperature;

(c) repeating a cycle of steps a and b to measure a second elapsed time;

(d) comparing the difference between the first elapsed time and the second elapsed time with a specified value, wherein if the difference between the first elapsed time





and the second elapsed time is less than the specified value the preheating is terminated and an object is carried into the furnace, and wherein if the difference between the first elapsed time and the second elapsed time is greater than the specified value, step c is repeated to measure a subsequent elapsed time which is compared according to step d with the elapsed time measured in the immediately preceding cycle.

4,678,433

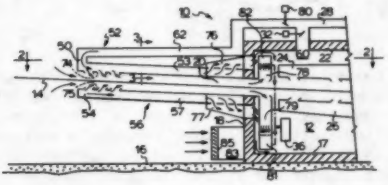
OVEN SYSTEM HAVING A HEATED SNOUT AT ITS ENTRANCE END

Kenneth Ellison, Brampton, Canada, assignor to Hunter Engineering (Canada) Ltd., Mississauga, Canada

Filed Dec. 30, 1985, Ser. No. 814,324

Int. Cl.[4] F27B *9/28*

U.S. Cl. 432—59 **6 Claims**



1. An oven system for air curing coated product which is moved in a continuing manner through said oven and is coated with a heat-curable, solvent releasing coating material, comprising:

an oven line having at least one oven zone through which the coated product is arranged to travel, which zone is operated using only air at elevated temperatures;

said oven line having an entrance end for said at least one oven zone and a port through which said coated product enters said oven line from outside said oven line;

means for capturing substantially all indraft air entering said entrance end near said port;

air balance fan means for circulating said indraft air in at least a first volume to a heat exchanger for heating therein to at least said elevated oven temperature, and thence in a return line back to said oven line;

exhaust fan means adapted to withdraw solvent laden air from within said at least one oven zone and thence to deliver said solvent laden air to

an afterburner having as its principal fuel source the volatile solvent released from said coating material and contained in said solvent laden air, said afterburner being the heat source for said heat exchanger;

and a snout extending away from said entrance end in a direction opposite to the direction of flow of said coated product as it enters said port;

said snout having therein at least one hollow duct with a surface portion of the duct positioned in close, facing proximity with a major portion of the area of the flow path along which said coated product moves within said snout;

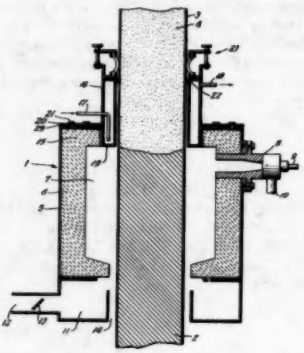
said hollow duct being adapted to receive at least a portion of the heated indraft air in said return line, to elevate the temperature of said duct outer surface to an infrared radiating condition for heating said product and to discharge said heated indraft air into at least one oven zone.

4,678,434

BAKING FURNACE FOR ELECTRODES

Erik Q. Dahl; Arnfinn Vatland, and Olaf T. Vegge, all of VÅgsbygd, Norway, assignors to Elkem a/s, Norway

Filed Aug. 7, 1986, Ser. No. 894,261
Int. Cl.[4] F27D *1/18*
U.S. Cl. 432—242 **8 Claims**



1. A baking furnace for continuous production of elongated carbon bodies having uniform cross-section, said baking furnace being intended to be moved continuously or substantially continuously in relation to a casing containing unbaked carbonaceous electrode paste with a speed which corresponds to a preset baking speed for the carbon body, characterized in that the baking furnace (1) comprises an outer steel shell (5) and a refractory lining (6) arranged on the inside of the shell (5) said refractory lining (6) defining a combustion chamber (7), a cooling chamber (16) arranged between the upper part (15) of the refractory lining (6) and the casing (3), gas sealing means (23) arranged above the cooling chamber (16) and an off-gas channel (11) arranged below the refractory lining (6).

4,678,435

TEMPORARY DENTAL CROWN AND METHOD OF FORMING THE SAME

Harry A. Long, 75 Mountain Spring Dr., Sparta, N.J. 07871

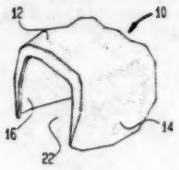
Filed Jul. 28, 1986, Ser. No. 890,104
Int. Cl.[4] A61C *5/08*
U.S. Cl. 433—218 **4 Claims**

1. A temporary dental prothesis made of plastic material to be fitted on a prepared tooth to receive a permanent crown comprising:

a. shell means of a generally fixed dimensional shape having a transverse wall means defining an occlusal layer configuration on the outer surface thereof, said transverse wall means having a buccal side and a lingual side,

b. first sidewall means connected at one end to said buccal side of said transverse wall means and defining a buccal layer configuration on the outer surface thereof,

c. said first sidewall means having a first shaped free edge remote from the end of the first sidewall means connected to the buccal side of the transverse wall means disposed in assembled position proximate to the gingival surface about said prepared tooth, and said first sidewall means reducing in thickness from said point of connection to the buccal side of said transverse wall means to said free edge on said first sidewall means,



d. second sidewall means connected at one end to said lingual side of the transverse wall means and defining a lingual layer configuration on the outer surface thereof,

e. said second sidewall means having a second shaped free edge remote from the end of the second sidewall means connected to said lingual side of the transverse wall means disposed in assembled position proximate to the gingival surface about said prepared tooth, and said second sidewall means reducing in thickness from said point of connection to the lingual side of said transverse wall means to said free edge on the second sidewall means,

f. said shell means having fully formed openings at the mesial and distal ends thereof, and

g. said transverse wall means, first sidewall means, and second sidewall means forming a cavity in the shell means fully open at the mesial end and the distal end of the shell means for receiving a self-curing acrylic resin.

4,678,436

COLOR-CHANGEABLE CEMENT COMPOSITION FOR DENTAL USE

Kenji Kondo; Shigeru Katsuyama, both of Tokyo; Shoji Akahane, Higashikurume, and Kentaro Tomioka, Chofu, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Apr. 29, 1986, Ser. No. 857,162
Claims priority, application Japan, May 27, 1985, 60-113581
Int. Cl.[4] A61K *5/01*
U.S. Cl. 433—228.1 **7 Claims**

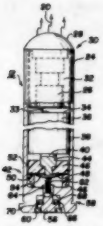
1. A color-changeable cement composition for dental use comprising a first component comprising a metal oxide as a major ingredient, and a second component which reacts with the first component to form a set body, wherein said composition contains a substance which changes its color tone with the change in pH so that the color tone of said composition changes upon initial setting of said cement composition.

4,678,437

CARTRIDGE AND TARGET DEVICE FOR MARKMANSHIP TRAINING

Bentley N. Scott, Richardson; Vernon R. Porter, Plano, and Samuel R. Shortes, Lewisville, all of Tex., assignors to Technology Network International, Inc., Richardson, Tex.

Filed Sep. 27, 1985, Ser. No. 781,047
Int. Cl.[4] G09B 9/00
U.S. Cl. 434—21 9 Claims



1. Marksmanship training apparatus for a weapon having a barrel, a cartridge chamber to hold a cartridge in position for firing and a firing mechanism for causing the cartridge to fire, said marksmanship training apparatus comprising:

an electrically conductive cartridge casing structured for disposition in the cartridge chamber of said weapon, said electrically conductive cartridge casing having a first end and a second end;

energy emitting means positioned to emit energy from said first end of said electrically conductive cartridge casing when activated, said energy being a pulse of energy with a rise time of less than 8 milliseconds;

a power source positioned within said electrically conductive cartridge casing and connected to said energy emitting means;

energy activation means positioned within said electrically conductive cartridge casing and electrically connected to complete an electrical circuit through said energy emitting means, said electrically conductive cartridge casing, said power source and said energy activation means when said energy activation means is activated to the on position by the firing mechanism of said weapon and thereby activate said energy emitting means; and

a transfer mechanism mounted for axial movement within said electrically conductive cartridge casing and positioned between said energy activation means and said second end of said electrically conductive cartridge casing to transfer the energy imparted by said firing mechanism to said energy activation means to activate said energy activation means;

said energy activation means comprises a snap action switch including a stationary terminal which is electrically connected to the power source and movable terminal which is positioned to be contacted by said transfer mechanism and moved to contact said stationary terminal to activate said energy activation means;

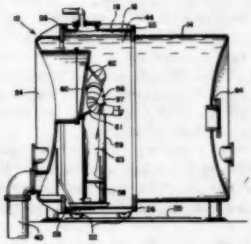
said movable terminal comprises a disc which is rigidly supported around the periphery thereof and includes a cupped portion which protrudes from said periphery in the direction of said transfer mechanism.

4,678,438

WEIGHTLESSNESS SIMULATION SYSTEM AND PROCESS

Hubert C. Vykukal, Los Altos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1986, Ser. No. 924,398
Int. Cl.[4] G09B 9/00
U.S. Cl. 434—34 13 Claims



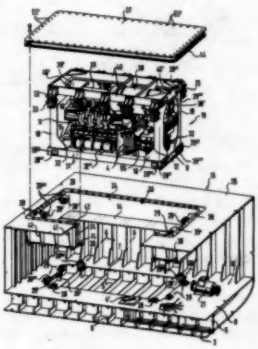
1. A weightlessness simulation chamber, which comprises a chamber, a suit in said chamber connected to atmospheric pressure, means for hermetically sealing said chamber, means connected to said chamber for establishing a pressure in said chamber less than atmospheric pressure, and means connected to said chamber for supplying a body of water to said chamber.

4,678,439

ENGINE INSTALLATION FOR USE IN A SHIP

Norbert Schlichthorst, Beckdorf, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 17, 1985, Ser. No. 756,032
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426333
Int. Cl.[4] B63H 21/30
U.S. Cl. 440—11 42 Claims



1. A modular engine installation for driving a ship through water, said ship having hull means with a plurality of decks and propeller means being attachable to said modular engine installation, said hull means having opening means for receiving said modular engine installation, said modular engine installation comprising:

engine means being a primary source of power for propelling said ship through water;

a prefabricated modular container for containing said engine means;

said prefabricated modular container having a bottom means, side means and top means;

said side means having a plurality of portions, a first part of said portions being joined to one another to form corner portions therebetween; said bottom means having portions being joined to a second part of said portions of said side means to form corner portions between said bottom means and said side means;

means for attaching said prefabricated modular container to said hull means for taking up torque from and weight of said prefabricated modular container, said means for attaching being disposed at an upper portion of said prefabricated modular container, and for being disposed below an upper portion of said opening means to suspend said prefabricated modular container in said hull means;

said engine means having means for transferring torque to said propeller means of said ship;

said propeller means being separate from said modular engine installation and being attached to said hull;

said prefabricated modular container having means for permitting said torque transferring means to pass therethrough;

removable cover means for covering said opening means in said hull means, at least when said prefabricated modular container is disposed in said hull means of said ship; and

said prefabricated modular container being insertable in and completely removable from said opening means and said hull means of said ship, substantially in toto, with said engine means being contained in said prefabricated modular container, whereby time required for refitting of said modular ship engine installation is minimized.

4,678,440

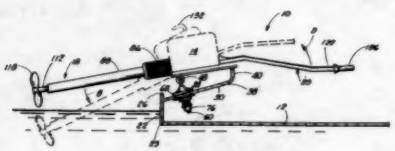
BOAT AND PROPULSION SYSTEM

Roland Rodrigue, and Ronnie Rodrigue, both of 2233 N. Von Braun, Harvey, La. 70058

Continuation of Ser. No. 643,123, Aug. 22, 1984. This application Sep. 16, 1986, Ser. No. 911,748

Int. Cl.[4] B63H *5/12*

U.S. Cl. 440—53 **7 Claims**



1. A boat and propulsion system, comprising:

a. a boat having a transom having a substantially planar horizontal upper surface extending side by side of said boat and being lower than the height of the gunnels of said boat, said transom transitioning from said substantially horizontal upper surface to substantially vertical surfaces at its extremities, said vertical surfaces merging with said gunnels;

b. a generally planar platform integrally attached to the side walls and said transom of said boat and defining a well area within said boat for receiving and draining backwash from said boat, said platform being inclined at an angle to the horizontal from said transom forward;

c. means for providing thrust to said boat, said means being removably mounted on said platform above and displaced forward of said transom and pivotal between a first neutral position and a second thrusting position;

d. means for limiting the angle of pivot of said thrusting means, said limiting means including said horizontal upper surface of said transom; and

e. means for limiting the rotational movement of said thrusting means, said limiting means including said vertical surfaces of said transom.

4,678,441

SYSTEM FOR DISCHARGING WATER FROM CRANK CHAMBER

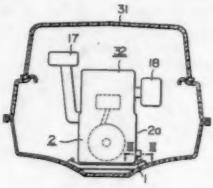
Masaaki Murase, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jan. 21, 1986, Ser. No. 820,176

Claims priority, application Japan, Jan. 24, 1985, 60-11644

Int. Cl.[4] B63H *21/10*

U.S. Cl. 440—88 **5 Claims**



1. A system for discharging water from a crank chamber of a compression-type crank chamber two-cycle engine comprising:

a water discharge passageway for connecting a bottom portion of the crank chamber with an outside area;

valve means for opening and closing said passageway for allowing discharge of water accumulated in the crank chamber upon operation of a piston of the engine to create positive and negative pressures in the crank chamber while permitting normal operation of the engine with the crank chamber sealed including a first pressure-responsive valve mounted in said water discharge passageway and adapted to be brought to an open position to allow discharge of water through said passageway from the crank chamber by a positive pressure in the crank chamber produced by operation of the piston and adapted to be brought to a closed position to seal the crank chamber by a negative pressure in the crank chamber produced by operation of the piston;

a second valve mounted in said water discharge passageway for operation between open and closed positions; and

a manually operated member for manually opening and closing said second valve while said first valve is operating to allow discharge of water via said first valve through the passageway when the first valve is in an open position.

4,678,442

APPARATUS RESPONSIVE TO SHORTAGE OF COOLANT IN AN ENGINE OF A BOAT

Hiroshi Nishida, Miki, and Mitsuhiro Yazaki, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 3, 1985, Ser. No. 752,151

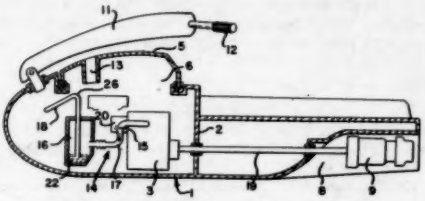
Claims priority, application Japan, Jul. 5, 1984, 59-101836[U]

Int. Cl.[4] B63H *21/32*

U.S. Cl. 440—89 **3 Claims**

1. In a boat including a hull forming an engine room, an internal combustion engine in said room, said room being substantially closed except for an air opening through which engine intake air flows into said room, whereby said engine is supplied with air from the room during operation, an exhaust system connected to said engine and extending to outside of said room, said engine including coolant flow means, cooling means in said room connected to said coolant flow means to receive coolant discharged from said engine and connected to inject said coolant into said exhaust system in said room, whereby the coolant is normally discharged during engine operation out of said room together with the exhaust gas from

said engine, and fuse means provided in said exhaust system in said room downstream from the location where the coolant is injected, said fuse means being fusible to form an opening



when the exhaust gas in said exhaust line exceeds a predetermined temperature, whereby exhaust gas enters said room through said opening and mixes with intake air entering the engine.

4,678,443

INFLATABLE LIFERAFT

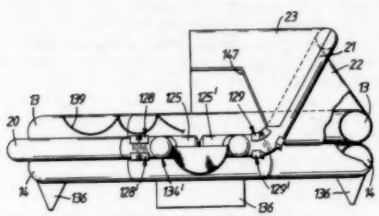
David V. Edwards, Billingshurst, and Michael A. Newman, Haslemere, both of England, assignors to RFD Limited, Surrey, England

Filed Feb. 20, 1986, Ser. No. 831,330

Claims priority, application United Kingdom, Feb. 22, 1985, 8504628

Int. Cl.[4] B63B *35/58*

U.S. Cl. 441—38 **11 Claims**



1. An inflatable liferaft comprising an inflatable buyoancy tube side wall structure and a floor so secured at its periphery to the side wall structure that the inflated liferaft can be used when deployed on water either way up, an inflatable protective tube structure, supply means to supply inflation medium to the side wall structure and the protective tube structure upon deployment of the liferaft to inflate the protective tube structure and the side wall structure together, said protective tube structure being so constructed and arranged in relation to the side wall structure that when inflated with the side wall structure it takes up a protective location in which it extends entirely round the outside of the side wall structure to protect the side wall structure from damage and from which it is displaceable either way to a canopy support location above the floor of the liferaft, and a canopy assembly so secured to the protective tube structure and to the side wall structure that when the protective tube structure moves to its canopy support location the canopy assembly deploys with the protective tube structure and is supported thereby.

4,678,444

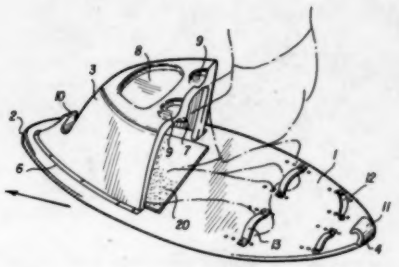
WATER GLIDING SCOOTER BOARD

F. Javier Monreal, 4242 Barker Mill Rd., Jamesville, N.Y. 13078

Continuation-in-part of Ser. No. 672,813, Nov. 19, 1984, Pat. No. 4,629,434, and a continuation-in-part of Ser. No. 822,627, Jan. 27, 1986. This application Feb. 24, 1986, Ser. No. 832,389

Int. Cl.[4] A63C *15/00*

U.S. Cl. 441—65 **6 Claims**



1. A sporting device, herein called water gliding scooter board, capable of accomodating a water gliding rider in the positions of low kneeling, high kneeling and high sitting, and of traveling in two opposite directions, comprising:

a floating oval board constructed of a seamless, foam-filled plastic sheeting unitarian body measuring 4′ to 5′ in approximate length, 15″ to 24″ in approximate width at its widest middle section and 1″ to 3″ in thickness and having rounded contours,

a hard plastic hood mounted and screwed in place at one end of said oval board, said hood approximately shaped as a truncated irregular pyramid, enclosed and tapered to a point towards the end of the said board upon which it is mounted, and fully open in the direction facing the opposite end of said board; said plastic hood having a top surface elevated 10″ to 14″ above the upper surface of said board, said top surface of said hood having at the edge that faces the other end of the said board a pair of smoothly recessed indentations capable of accomodating the rider's knees when in a high kneeling position and traveling in a first direction; said plastic hood at its said top surface having a shallow and smoothly recessed dish-like indentation capable of accomodating the rider's buttocks when in a high sitting position facing the other end of said board and traveling in a second direction opposite the said first direction,

a first foot receiving means in the form of elestic strap(s) capable of accomodating the rider's feet when in a high kneeling position traveling in the said first direction,

a second foot receiving means in the form of elastic strap(s) capable of accomodating the rider's feet in a high sitting position traveling in the said second direction,

a first two-rope engaging means in the form of a smooth, hook-shaped protrusion placed at the said tapered enclosed end of the said hood, capable of receiving the pulling tow-rope when traveling in the said first direction

a second two-rope engaging means in the form of a smooth, hook-shaped protrusion placed at the very tip of the said other end of said board, capable of receiving the pulling tow-rope when traveling the said second direction.

4,678,445

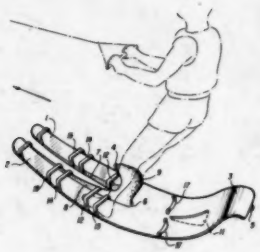
WATER AND SNOW WISHBONE SHAPED SLED FOR ONE OR TWO

F. Javier Monreal, 4242 Barker Hill Rd., Jamesville, N.Y. 13078

Continuation-in-part of Ser. No. 751,599, Jul. 2, 1985, Pat. No. 4,603,870, and Ser. No. 672,813, Nov. 19, 1984. This application Dec. 9, 1985, Ser. No. 806,423

Int. Cl.[4] A63C *15/00*

U.S. Cl. 441—72 **9 Claims**



1. A one piece water and snow gliding board, a sled, biforked as a wishbone or letter Y, capable of supporting one or two riders, one behind the other, in the positions of standing, sitting, kneeling or lying, and capable of traveling in either of two opposite directions, comprising:

a pair of ski-like members that represent the front of said sled when traveling in a first direction, front part that, as a fork, has the two said ski members symmetrical to one another with a free space in between and which measures, from the front tips of said skis to the point of bifurcation or crotch, ⅓ to 3/5 of the total length of said sled;

a wide section that is the rear of said sled when traveling in said first direction, wide section that is approximately as wide as the combined width of the two said ski members plus their in-between free space, being the front-to-rear length of said wide section, from said crotch of said sled to its rear end 2/5 to ⅓ of the total length of said sled;

a humped up seat, extruded out of the said crotch area of the said sled, seat that rises 12" to 16" above said sled and which is capable of accomodating one sitting rider when said sled travels in either of said opposite directions;

an extruded up-turned lip that is formed, as a continuum, by the medial edges of the two said ski members, up-turned lip that starts at zero at the front of each ski member and gradually rises to 3" to 4" towards the said crotch of said sled, at which crotch area said lip is built up to form said humped-up seat;

a vertical, down-pointing fin parallel with both said directions of traveling, located at the undersurface of the said wide section of said sled;

a first foot receiving means for engaging the feet of the front rider traveling in said first direction when said rider sits on said humped-up seat with his/her feet placed over the front of the said ski members;

a second foot receiving means for engaging the feet of the said front rider when said rider stands at mid-length of the said ski members and traveling in the said first direction with a second rider accomodated at the rear of said sled;

a third foot receiving means for engaging the feet of a single standing rider when said rider places his/her weight on the sides of the said humped-up seat and traveling in the said first direction;

a fourth foot receiving means for engaging the feet of the rider in various positions of standing, sitting and kneeling and facing the said rear of said sled and traveling in the said second direction;

a first tow-rope engaging means shaped as a down-pointing hook and mounted at the front tip of the said humped-up seat, front of tip so considered when traveling in said first direction;

a second tow-rope engaging means shaped as a down-pointing hook and mounted at the very rear of said sled, rear so considered when traveling in said first direction;

a pair of hook/eye rings placed, each one respectively, at the very front tips of the said ski members, front tips so considered when traveling in said first direction.

4,678,446

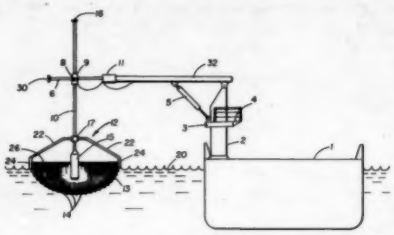
DEVICE FOR RESCUING PERSONNEL FROM WATERS

Paul C. Dahan, Pittstown, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 489,637, Apr. 28, 1983, abandoned. This application Nov. 4, 1985, Ser. No. 794,329

Int. Cl.[4] B63C *9/00*

U.S. Cl. 441—80 **1 Claim**



1. A device for rescuing personnel from water comprising:

a crane on a boat, said crane including a horizontally and vertically movable boom;

an elongated rigid member vertically and freely movable with respect to said boom;

means connected to said boom for permitting inward and outward movement of said elongated member along the axis as defined by said crane arm;

buoyant means operatively connected to said elongated member for floating on the water;

a net extending below said buoyant means;

said buoyant means also defining the vertical relative position of said elongated member with respect to said boom while positioning individual(s) in said net; and

means for selectively locking said elongated member relative to said boom when said net is moved to or from said boat and for unblocking said elongated member relative to said boom when said buoyant means and net are placed in water, said permitting means comprising a pair of rails and a gimbal mechanism slidable on said rails, said gimbal mechanism being operatively connected to said elongated member for compensating for motion of said boat and the water surface, whereby said buoyant means and said net follow contour of the water surface.

4,678,447

PROCESS OF MANUFACTURING FOR A HIGH-RESOLUTION COLOR CATHODE RAY TUBE

Charles J. Prazak, III, Elmhurst, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 10, 1985, Ser. No. 743,184

Int. Cl.[4] H01J *9/227*

U.S. Cl. 445—45 **4 Claims**

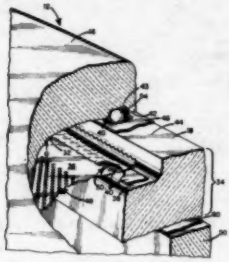
1. For use in a highresolution color cathode ray tube, a front assembly comprising:

a faceplate with a target area for receiving at least one pattern of phosphor deposits, said faceplate having a sealing area circumscribing said target area including a plurality of first substantially radially oriented registration-affording V-grooves selectively oriented thereon;

a shadow mask support assembly having a frame ultimately

constituting a part of the tube envelope supporting a tensed foil shadow mask in precise adjacency to said target area, said frame having a sealing area geometrically matching said faceplate sealing area, and which has thereon a like plurality of second substantially radially oriented registration-affording V-grooves selectively located in alignment with said first V-grooves on said sealing area of said faceplate; and

a like plurality of balls disposed between the mated first and second registration affording V-grooves of said faceplate



and said frame for establishing precise registration between said faceplate and said shadow mask in the process of screening said pattern of phosphor deposits on said target area and later in the final assembly of said tube;

said faceplate assembly having a first cement composed of a vitrifying cement in the regions of said mated registration-affording V-grooves, and a second cement composed of a divitrifying cement elswhere in said sealing area for permanent bonding of said faceplate and said frame, said vitrifying cement softening at a temperature below the divitrifying temperature of said devitrifying cement.

4,678,448

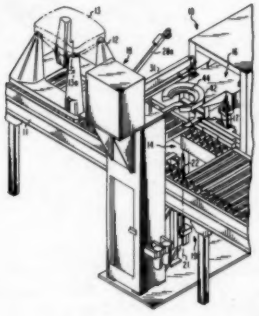
KINESCOPE FUNNEL THUMPER AND FLUSH DEVICE

David E. Booth, New Providence; Steven G. Smith, Harrisburg, and John L. Adams, Sinking Springs, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 25, 1986, Ser. No. 855,601

Int. Cl.[4] H01J *9/38*

U.S. Cl. 445—60 **11 Claims**



1. A device for simultaneously thumping and flushing a kinescope funnel having a faceplate and a neck, said device being situated in the proximity of a conveyance mechanism whereby said device removes said funnel from, and replaces said funnel on, said conveyance mechanism, said device comprising:

funnel lift means, said funnel lift means being horizontally moveable between an empty position and a lift position, and vertically moveable between said lift position and a thump position; whereby said funnel lift means moves horizontally into engagement with a funnel and vertically to position said funnel at said thump position;

neck centering and orienting means arranged to move in unison with said funnel lift means, said neck centering and orienting means being configured to engage said neck to substantially center said neck with respect to a vertical axis, and to orient said neck substantially parallel to said axis;

fluid injection means arranged to move vertically along said axis to inject fluid into said funnel when said funnel is in said thump position; and

thumper means arranged to thump said faceplate when said funnel is in said thump position.

4,678,449

TRACKWAY TOY ASSEMBLY

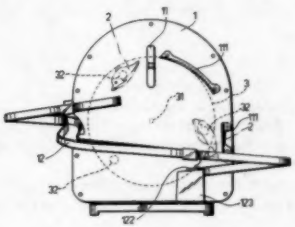
Yoshio Udagawa, 3-13, 3-Chome, Mama Ichikawa-Shi, Chiba-Ken, Japan

Filed Feb. 3, 1986, Ser. No. 825,324

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 8525183[U]

Int. Cl.[4] A63H *33/26*

U.S. Cl. 446—136 **4 Claims**



1. A trackway toy assembly, which comprises:

a support having a plate-like member, the plate-like member including a viewable front face and a rear face opposite the viewable front face;

at least one movable toy piece which can be attracted by magnetic force;

an interrupted trackway for the toy piece to slide along, the trackway being mounted on the plate-like member, the trackway having a first end and a second end, the first and second ends being disposed on the viewable front face of the plate-like member, the first end being disposed at a level which is lower than that at which the second end is disposed so that the trackway slopes downwardly from the second end to the first end and so that the toy piece is adapted to slide along the trackway from the second end to the first end, the first and second ends defining a gap therebetween situated on the viewable front face of the plate-like member;

at least one magnetic means for magnetically attracting the toy piece; and

a rotatable circular member disposed on the rear face of the plate-like member and rotatable with respect thereto, the one magnetic means being mounted to the rotatable circular member and movable in a circular path therewith, the first and second ends of the interrupted trackway being further disposed along the circular path of the magnetic means, wherein the toy piece is adapted to be attracted to and carried by the magnetic means from the first end of the trackway to the second end in a circular motion upon rotation of the circular member, to give the impression that the toy piece is jumping across the gap from a lower level to a higher level, and wherein upon reaching the

second end, the toy piece slides along the trackway from the second end to the first end.

4,678,450

TOY LIGHT SWORD

John E. Scolari, La Mesa; Robert T. Warner, Poway, and Joe E. Deavenport, San Diego, all of Calif., assignors to Life Light Systems, San Diego, Calif.

Continuation-in-part of Ser. No. 453,355, Dec. 27, 1982, abandoned. This application Jun. 7, 1984, Ser. No. 618,316

Int. Cl.[4] A63H *5/00, 33/26*

U.S. Cl. 446—405 **28 Claims**

1. A toy light sword comprising:

an elongated, hollow, transparent blade;

a handle connected at one end of said blade;

flash lamp actuating means mounted to said handle;

a DC power source;

enabling switch means for selectively connecting said DC power source to said flash lamp actuating means for energization thereof;

high-intensity flash lamp means in said hollow blade for emitting a burst of high-intensity light when actuated by said flash lamp actuating means, said flash lamp means lighting the full length of said blade for a short duration, said blade appearing as a long, thin, short duration, glowing sword when viewed externally upon actuation of said flash lamp means; and

trigger switch means for selectively applying the energy in said flash lamp actuating means to said high-intensity flash lamp means to fire said lamp means;

said flash lamp actuating means comprising:

storage capacitor means connected across said flash lamp means;

means connected to said flash lamp means for triggering said flash lamp means into conduction;

oscillator means coupled to said source of DC power;

a DC/AC inverter connected to the output of said oscillator means;

an AC/DC converter and voltage multiplier connected between said DC/AC inverter and said storage capacitor means;

a feedback network;

comparator means connected between said feedback network and said oscillator; and

means for coupling the voltage output from said voltage multiplier to said feedback network, said comparator means actuating said oscillator means when a predetermined reduction in the voltage on said storage capacitor means is detected;

whereby said storage capacitor means is maintained at a desired voltage level sufficient to actuate said flash lamp means as desired.

4,678,451

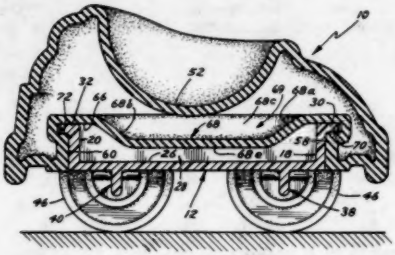
INTERFITTING TOY VEHICLE BODY AND CHASSIS

Frank D. Ventura, Newburyport, Mass., assignor to Kenner Parker Toys Inc., Beverly, Mass.

Filed Oct. 21, 1985, Ser. No. 789,817

Int. Cl.[4] A63H *17/26*

U.S. Cl. 446—471 **6 Claims**



1. A toy vehicle comprising a chassis of relatively hard material including a box-like frame having oppositely directed first and second flanges thereon, and a body of relatively soft, resilient material having walls forming a downwardly facing recess, said walls being formed with first and second oppositely directed grooves for receiving therein said flanges, said first groove having a width substantially corresponding to the thickness of said first flange and said second groove having a width substantially corresponding to the thickness of said second flange, whereby said body can be deformed sufficiently to permit said flanges to be introduced into said grooves and remain received therein via which said body is attached to said chassis.

4,678,452

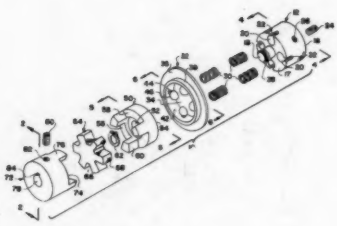
OVERLOAD RELEASE CLUTCH

Richard D. Nelson, Safety Harbor, and James D. Evans, Clearwater, both of Fla., assignors to Performance Feeders, Inc., Clearwater, Fla.

Filed Jul. 26, 1985, Ser. No. 759,570

Int. Cl.[4] F16D *7/04, 3/68*

U.S. Cl. 464—38 **7 Claims**



1. An overload release clutch assembly comprising

(a) a cylindrical spring housing and integral hub with a shaft mounted in the hub at a first end and an axially projecting integral shaft at a second end with a plurality of equally spaced spring seats at the periphery of the housing, each of sufficient depth to accommodate a coil spring and each having a groove exposing an upper portion of the spring seat through an outside wall of the spring housing;

(b) a detector ring having an annular opening sufficient to encompass the spring housing, the ring having an integral axially projecting flange with an inner and outer wall, multiple integrally connected bridging members joining a

detent bullet to the inner wall, the bridging members corresponding in number and spacing to the spring seats;

(c) a bullet detent housing containing a central annular opening sufficient in diameter to accept the projecting shaft from the spring housing in a loaded mode and having on a first end engagable with the bullets, multiple shallow depressions corresponding in number and spacing to the detent bullets and on a second end, means for engaging a device for imparting rotary motion to the detent housing;

(d) means mounted on the end of the spring housing integral shaft for holding the spring housing, detector ring and bullet detent housing together; and

(e) a means for imparting rotary shaft motion to the detent housing.

4,678,453

CONSTANT VELOCITY RATIO UNIVERSAL JOINT

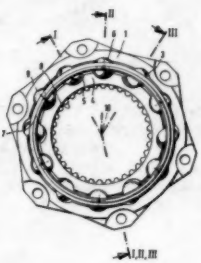
Erich Aucktor, and Günter Gärtner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Continuation of Ser. No. 608,913, May 10, 1984, abandoned, which is a continuation of Ser. No. 341,479, Jan. 21, 1982, abandoned. This application Oct. 1, 1985, Ser. No. 783,057

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1981, 3102871

Int. Cl.[4] F16D *3/21*

U.S. Cl. 464—144 **5 Claims**



1. In a rotary constant velocity universal joint having a joint center axis including an outer hollow joint member having an inner wall provided with outer grooves, an inner joint member arranged in said outer joint member, with said inner joint member having an outer wall with a number of inner grooves therein corresponding to the number of outer grooves in said outer joint member, with one groove of each of said outer and inner joint members jointly comprising a groove pair, with each groove pair, for torque transmitting purposes, receiving a ball which is guided by a cage arranged between said inner and outer joint members and whose center is maintained in a plane which bisects the angle between the axes of said inner and outer joint members, said grooves pairs including oblique pairs each comprised of grooves which extend at an oblique angle relative to said center axis of said joint, and parallel groove pairs each comprised of grooves which are arranged to extend parallel to the direction of said joint axis, the improvement comprising that said oblique groove pairs and said parallel groove pairs are arranged to includes adjoining oblique groove pairs with one parallel groove pair therebetween and that adjoining inner and outer grooves, respectively, of said oblique groove pairs are arranged at angles of inclination which extend transversely relative to each other.

4,678,454

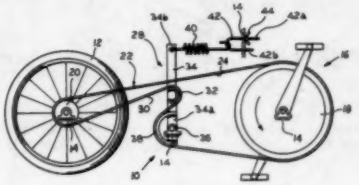
INERTIA CONTROLLED LOADING SYSTEM

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill.

Continuation of Ser. No. 683,677, Dec. 19, 1984, abandoned. This application Jun. 23, 1986, Ser. No. 879,530

Int. Cl.[4] F16H *7/08*

U.S. Cl. 474—101 **22 Claims**



1. In a controllable loading system having a rotatable member mounted on a frame together with means for rotating the rotatable member, a drive pulley operatively associated with the rotating means and a driven pulley operatively associated with the rotatable member, and an endless belt member drivingly interconnecting the drive and driven pulleys, the belt member imparting rotation of the rotating means to the rotatable member through frictional resistance relative to the drive and driven pulleys, the belt member having a surface in frictional driving engagement with the drive and driven pulleys and having a tension side and a slack side, the improvement comprising:

means for providing a resistive load on the tension side of the belt member, said resistive load means including tension adjusting means for providing a fixed resistive load on the rotating means at any given constant speed of the rotatable member, the resistive load on the rotating means normally increasing or decreasing during any acceleration or deceleration of the rotatable member until the rotatable member again reaches a constant speed, said resistive load means also including friction altering means for providing enhanced variations in resistive load on the rotating means during any changes in speed of the rotatable member;

said tension adjusting means being operatively associated with said friction altering means and the belt member being in arcuate engagement with said friction altering means on the tension side thereof;

the variations of resistive load resulting from changes in speed of the rotatable member through the rotating means and the belt member being multiplied by a factor dependent upon the angle of arcuate engagement of the belt member with said friction altering means to provide the enhanced variations in resistive load;

whereby the torque on the rotating means required to rotate the rotatable member through the belt member can be varied for both constant speed and changing speed operation by the controllable loading system.

4,678,455

METHOD OF MAKING A FIBER-LOADED POLYMERIC SHEET

Gerald C. Hollaway, Jr., Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

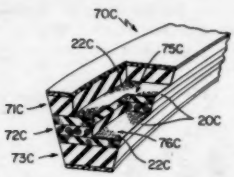
Division of Ser. No. 574,439, Jan. 27, 1984, Pat. No. 4,634,413, which is a division of Ser. No. 281,153, Jul. 7, 1981, Pat. No. 4,445,949. This application Sep. 26, 1986, Ser. No. 912,032

Int. Cl.[4] F16G *1/10, 5/08*

U.S. Cl. 474—263 **20 Claims**

1. In an endless power transmission belt having at least one part thereof comprised of polymeric material which has a plurality of elongate reinforcing fibers embedded therein with said polymeric material serving as a matrix for said fibers, the improvement in which said fibers comprise between 40% and

70% by weight of said one part and at least 70% of said fibers are disposed in parallel relation, said fibers each having a length that falls in the range between roughly one-fourth of an



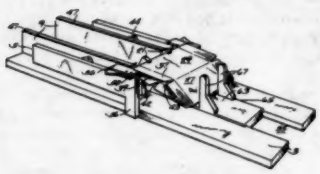
inch and two inches and having a diameter that falls in the range between roughly five microns and several hundred microns.

4,678,456

CARTON OPENING APPARATUS

Biagio Nigrelli, Sr., 14829 Moraine Rd., Kiel, Wis. 53042

Filed Mar. 24, 1986, Ser. No. 843,016
Int. Cl.[4] B31B *1/78*
U.S. Cl. 493—309 **10 Claims**



1. Apparatus for opening folded carbon blanks having sides and associated closure flaps extending from the ends thereof, the flaps of adjoining sides being separated by slits, the blanks being folded into an upper layer and a lower layer, each layer having two carton sides and associated flaps in facing contact with the sides and flaps of the other layer comprising:

a. an elongated frame;

b. stripper finger means translatably mounted to the frame for propelling a blank downstream along an opening path to thereby create leading and trailing edges and leading and trailing flaps in the blank;

c. support plate means mounted to the frame for supporting the blank lower layer sides at a first level along a first section of the opening path, the support plate means terminating at a second section of the opening path, the blank flaps overhanging the support plate means;

d. top guide means fixedly attached to the frame for maintaining contact between the blank lower layer sides and the support plate means;

e. spring plate means mounted to the frame at the second section of the opening path proximate the support plate means termination point for inserting between the blank trailing upper and lower flaps and for supporting the blank upper trailing flaps at the first level at the second section of the opening path as the blank leading edge is propelled past the support plate means by the stripper finger means and for cooperating with the stripper finger means to maintain the blank trailing edge at the first level at the second section while leaving the unsupported blank leading edge free to tip slightly downwardly by gravity to a second level lower than the first level to thereby impart an oblique orientation to the blank and to partially open the blank; and

f. carrier means translatably mounted to the frame for stationarily receiving the leading edge of the angularly oriented and partially opened blank at the second level as the blank unsupported leading edge falls downwardly from the first to the second level when the stripper finger means propels the blank upper trailing flaps out of support contact with the spring plate means to permit continued downstream movement of the stripper finger means to open the blank into the opened condition.

9. A method of opening a folded carton blank having sides and associated closure flaps, the blank being folded into an upper layer and a lower layer, each layer having two sides and associated flaps, adjacent flaps having a slit therebetween comprising the steps of:

a. supporting the sides of the blank lower layer at a first level with a first support;

b. continuously propelling the supported blank in a downstream direction with the blank flaps projecting transversely to the direction of motion to create blank leading and trailing edges and leading and trailing sides with leading and trailing flaps flaps;

c. inserting a pair of laterally spaced second supports at the first level under the upper layer trailing flaps;

d. propelling the blank so that the leading sides and flaps move past support contact with the first support and the trailing upper flaps move into support contact with the second supports at the first level to permit the lower leading side to drop to partially open the blank and to permit the leading edge to tip by gravity downwardly to a second level lower than the first level to impart an oblique orientation to the blank;

e. propelling the blank upper trailing flaps past support contact with the second supports;

f. restraining the leading edge of the partially opened blank as it falls downwardly to the second level when the blank is propelled past support contact with the second supports; and

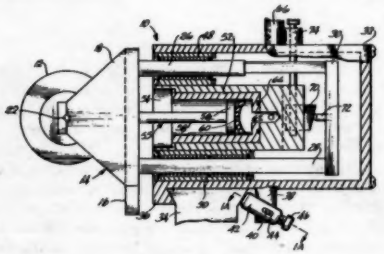
g. propelling the partially opened angularly oriented blank trailing edge while restraining the leading edge to completely open the blank.

4,678,457

APPARATUS FOR CONSTANT PRESSURE IN LINE-WEB CRUSH-SCORING

Yefim Slobodkin, Lyndhurst, Ohio, assignor to Avery International, Pasadena, Calif.

Filed Sep. 17, 1985, Ser. No. 776,850
Int. Cl.[4] B05B *1/14*
U.S. Cl. 493—355 **6 Claims**



1. An apparatus for applying a constant force to a mounting bracket which comprises:

(a) a mounting bracket providing means for receiving axially rotatable pressure means, for operating on a substrate;

(b) a pair of guide rods attached to, and extending in a direction away from, the means for receiving axially rotatable pressure means, said guide rods being parallel to one another and in substantially the same direction;

(c) a support receiving the pair of guides in a corresponding pair of substantially frictionless bearings to enable the guides to move back and forth within the support substantially without friction;

(d) a substantially frictionless plunger means positioned between the guide rods and extending from the mounting bracket into the support; and

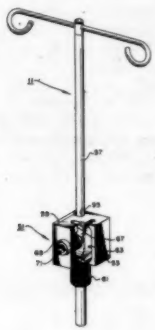
(e) means contained by the support for applying a predetermined unbiased force to the mounting bracket through the substantially frictionless plunger means.

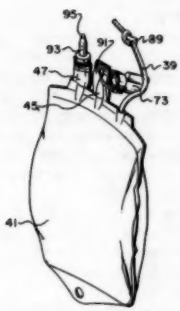
4,678,458

METHOD FOR AVOIDING MISTAKES DURING PLASMAPHERESIS

Terry M. Fredeking, 7520 David Dr., Fort Worth, Tex. 76118

Filed Jun. 9, 1986, Ser. No. 872,030
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—6 **13 Claims**





1. A method for avoiding mistakes in returning red blood cells to the correct donor during plasmapheresis, the method comprising the steps of:

collecting a quantity of the donor's whole blood in a whole blood collection container, the whole blood collection container being provided with a collecting port, a plasma removal port and a reinfusion port, and wherein the reinfusion port is sealed with a seal means bearing identifying indicia, the identifying indicia being unique to the donor;

separating the whole blood in the blood collection container into plasma and red cells;

removing the plasma from the blood collection container through the plasma removal port and sealing the plasma removal port;

removing the seal means from the reinfusion port after verifying the identifying indicia with the correct donor;

reinfusing the donor with the red cells; and

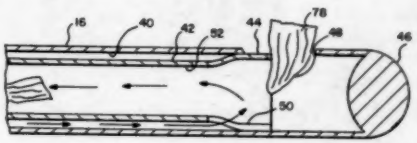
wherein the identifying indica comprise a key and lock.

4,678,459

IRRIGATING, CUTTING AND ASPIRATING SYSTEM FOR PERCUTANEOUS SURGERY

Gary Onik, San Francisco, and Leonard Ginsburg, Oakland, both of Calif., assignors to E-Z-EM, Inc., Westbury, N.Y. and Surgical Dynamics, Incorporated, San Leandro, Calif.

Filed Jul. 23, 1984, Ser. No. 633,514
Int. Cl.⁴ A61B *17/32*
U.S. Cl. 604—22 **13 Claims**



1. A surgical instrument comprising:

a housing;

a needle supported by said housing, said needle having a forward portion extending distally of said housing;

said needle including a first elongated tubular wall member defining a first bore, and having a port formed entirely within the sidewall of the forward portion of said first tubular wall member;

said needle including a second elongated tubular wall member defining a second bore sized to permit passage of tissue therethrough when said second tubular wall member is connected to a source of suction, said second tubular wall member having a forward portion extending radially outwardly and terminating in a cutting edge;

said second tubular wall member being positioned within said first tubular wall member with said cutting edge in contact with the sidewall defining said first bore, the forward portion of said first bore adjacent said port defining a tissue receiving portion communicating with said second bore;

said first and second tubular wall members being the only tubular wall members in said forward portion of said needle;

the wall of said second tubular wall member spaced inwardly from the wall of said first tubular wall member to define the opposing walls of an annular passageway adapted to be connected to a source of irrigating fluid, said annular passageway being the sole annular chamber in said forward portion of said needle;

said second tubular wall member being disposed for movement within said first tubular wall member to cause said cutting edge to move from a first position where tissue is drawn through said port into said tissue receiving portion of said first bore under suction to a second position where said cutting edge traverses said port to sever the tissue drawn therethrough, and to permit the severed tissue to be captured in said tissue receiving portion;

said second tubular wall member having an opening formed in its sidewall adjacent said cutting edge to provide internal communication between said annular passageway and said second bore to permit direct passage within said needle of irrigating fluid between said annular passageway and said second bore;

the forward portion of the sidewall of said first tubular wall member having no opening rearward of said cutting edge of said second tubular wall member when said cutting edge is in its first position;

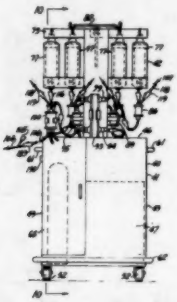
whereby the severed tissue is evacuated through said second bore with the aid of the irrigating fluid.

4,678,460

PORTABLE RAPID MASSIVE PARENTERAL FLUID WARMING AND INFUSION APPARATUS

Mark S. Rosner, 27400 Franklin, Apt. #821, Southfield, Mich. 48034

Filed Feb. 11, 1985, Ser. No. 700,389
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—113 **34 Claims**



23. Apparatus for the rapid warming and infusion of massive amounts of a parenteral fluid into a patient under conditions where time is of the essence comprising in combination:

(a) pressurized parenteral fluid supply means for rapidly infusing a massive amount of parenteral fluid into a patient;

(b) means for warming the massive amount of parenteral fluid prior to the infusion of said fluid into the patient, said means for warming including a heat exchanger means operable for transferring heat to parenteral fluid by the circulation of thermal liquid therethrough and a reservoir containing a thermal liquid for circulation through said heat exchanger

(c) means responsive to the temperature of said liquid for controlling the temperature of the parenteral fluid; and

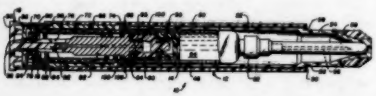
(d) means for controlling the rate of discharge of the parenteral fluid.

4,678,461

AUTOMATIC INJECTOR WITH IMPROVED GLASS CONTAINER PROTECTOR

Clarence M. Mesa, Rockville, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Filed Nov. 1, 1984, Ser. No. 667,443
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—157 **6 Claims**



1. In an automatic injector of the type including a housing having a glass container therein, a hypodermic needle connected with the forward end of said glass container, the rearward end portion of said glass container being defined by a generally cylindrical interior periphery, a generally cylindrical exterior periphery and an annular rear end edge between the rearward ends of said cylindrical peripheries, a plunger slidably sealingly mounted within the interior periphery of said container, a dosage of liquid medicament within said container forwardly of said plunger and a stressed spring actuating assembly releasable to transmit an axial force to said plunger to move the same forwardly so as to correspondingly move the glass container within said housing into a limiting position wherein said needle is extended into the muscle tissue of a patient and thereafter to move said plunger within said glass container to discharge the medicament dosage therein through said needle and into the patient, the improvement which comprises

a glass container protecting sleeve of thin plastic material assembled in an operative position within said housing with respect to said glass container when said stressed spring actuating assembly is in an unreleased condition so as to protect the glass container against fracture (1) due to handling impacts prior to release of said stressed spring assembly and (2) due to the force transmitted to said plunger following the release of said stressed assembly,

said sleeve including a cylindrical portion disposed in engagement with a cylindrical periphery of said glass container when said protective sleeve is in said operative position and an annular flange extending from the rear end of said cylindrical portion disposed in rearwardly adjacent relation to the rear end edge of said glass container when said protective sleeve is in said operative position.

4,678,462

STERILE CATHETER SECUREMENT DEVICE

Vincent L. Vaillancourt, 14 Bunyan Dr., Livingston, N.J. 07039

Filed Apr. 15, 1986, Ser. No. 852,179
Int. Cl.[4] A61M *25/02*
U.S. Cl. 604—180 **34 Claims**

1. A sterile securement device for retaining an inserted and placed catheter and a connected tubular conductor to and from an IV supply and the like, this sterile securement device adapted for retaining and maintaining this assembled connection condition by an adhesively-coated film pressed to the skin of a patient, this sterile securement device including:

(a) a frame of sheet material and providing at least three outer-edge, flat-surface portions and establishing interior thereof and therebetween a determined space or area;

(b) a bottom thin and flexible film member sized to extend substantially to the outer extents of said frame, this film coated on one surface with an adhesive acceptable for contact attachment to the skin of a patient, this film with the adhesively-coated side secured to the flat-surface portions of the frame;

(c) a flexible release sheet sized to extend to the inner edges of the frame and secured to said flat-surface portions of the frame, with the bottom thin and flexible film protecting the adhesive surface of that bottom film interior of said frame-edge, flat-surface portions;

(d) a protector sheet member of flexible composition and having an adhesive capability of one surface, this protective sheet member sized to extend substantially to the outer edges of said frame, and with said device in an assembled condition this protector sheet is adhesively secured to an outer surface of the frame and flexible release sheet, and

(e) a tab section not secured to said frame, this tab providing means for gripping and separating the frame from the protective sheet, and when said protector member is secured to said frame and release sheet, this protector sheet member covers that space between the release sheet and frame so that this spacing is protected from the environment, and after this protector is secured in place a sterilization of device is conventionally made.

4,678,463

DEVICES FOR INSERTION INTO A BODY CAVITY OF AN ANIMAL AND/OR APPLICATORS THEREFOR

Thomas D. Millar, 10 Menzies Place, Hamilton, New Zealand

Continuation of Ser. No. 706,942, Mar. 1, 1985, abandoned. This application Sep. 16, 1986, Ser. No. 908,890

Claims priority, application New Zealand, Mar. 1, 1984, 207341

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—285 6 Claims

1. A device for insertion into the vaginal cavity of an animal and for producing a controlled rate of release of chemicals into the body of the animal, said device comprising a spine having a body and two leg members hinged to said body, each leg member of said spine being hinged to said body by a separate integral stiffly resilient flexible hinge with a clearance space between inner faces of said leg members to assist each closure of said leg members towards each other, the spine being covered with a non-erodable matrix having at least some of the matrix forming part of the surface thereof or the matrix having incorporated therein an impregnated material impregnated with one or more chemical impregnants which are adapted to leach therefrom when exposed to body fluids, said covered leg members being of a size and foldable in a manner such that the cross sectional area and cross sections dimensions of the combined folded leg members when in a folded position are substantially the same as the cross sectional area and dimensions of the coated body of the device, said device having a withdrawal filament attached to said body at the end remote from said hinges.

4,678,464

ABSORBENT STRUCTURE WITH RESERVOIRS AND A CHANNEL

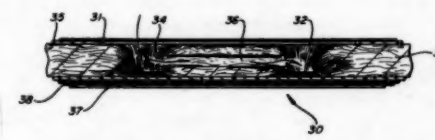
Dennis C. Holtman, Flemington, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 489,980, Apr. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 474,396, Mar. 11, 1983, Pat. No. 4,501,586, which is a continuation-in-part of Ser. No. 207,524, Nov. 17, 1980, abandoned. This application Feb. 22, 1985, Ser. No. 704,671

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.[4] A41B *13/02*

U.S. Cl. 604—385 R 13 Claims



1. An absorbent structure comprising a loosely-compacted cellulosic fibrous batt substantially rectangular in shape and having a length at least about 1.5 times the width of the batt, the width not exceeding about 5 inches, one surface of said batt containing at least 2 reservoirs spaced apart with a connecting channel, said reservoirs and the length of the channel being centered on the longitudinal axis of the batt, each reservoir (1) has a capacity of at least about 10 cc, (2) covers at least one square inch of surface, (3) is situated between the center and one transverse end of the substantially rectangular cellulosic fibrous batt, (4) covers less than about twenty-five percent (25%) of the surface area of the batt, and (5) is formed by compression of the cellulosic fibrous batt so that the depth of the reservoir is more than one-half ($\frac{1}{2}$) the thickness of the batt, the channel depth being at least one-half the depth of the reservoirs; a moisture-permeable facing covering the surface of the batt containing the reservoirs; and a moisture-impermeable backing covering at least the surface opposite the surface containing the reservoirs.

4,678,465

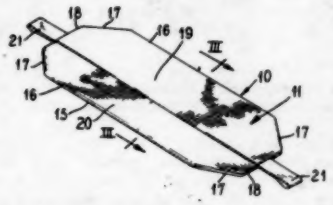
SANITARY PAD

Katarina Avejic, Chicago, Ill., assignor to Dunromin Enterprises Unlimited, Inc., Chicago, Ill.

Filed Jan. 10, 1986, Ser. No. 817,538

Int. Cl.[4] A61F *13/18*

U.S. Cl. 604—397 13 Claims



1. A washable reusable catamenial pad which comprises a pouch folded and stitched from a single strip of absorbent fabric having a rectangular bottom with folded over sides forming two top flaps overlying the bottom and freely overlapping each other along the longitudinal central length of the top of the pouch in the close position of the pouch, stitching securing together the flaps and bottom only at each end of the pouch, said flaps between said stitched ends being separable to open into an open mouth closed bottom bag by lifting and spreading the flaps apart, an impervious removable liner strip in the pouch overlying the bottom of the pouch, a soft absorbent strip covering the liner strip in the pouch, tapes secured to and extending from the stitched ends of the pouch at the longitudinal central portion thereof effective to close the pouch when tensioned, and said tapes being looped to receive fasteners of a support belt.

4,678,466

INTERNAL MEDICATION DELIVERY METHOD AND VEHICLE

Peter L. Rosenwald, 27 Broadview Rd., Cheshire, Conn. 06410

Continuation of Ser. No. 673,661, Nov. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 277,188, Jun. 25, 1981, Pat. No. 4,484,922. This application Dec. 27, 1985, Ser. No. 815,295

Int. Cl.[4] A61K *9/22*

U.S. Cl. 604—891 10 Claims

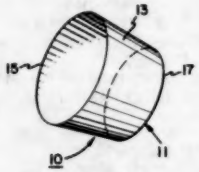
1. A method for delivering medication directly to a particular desired organ or site, both comfortably and efficiently, comprising the steps of:

A. providing a thin walled, substantially continuous, non-allergenic, elongated, hollow body having a generally tubular shape with

a. a first proximal edge comprising a generally rounded shape and defining a first portal zone,

b. a second distal edge comprising a generally rounded shape and defining a second portal zone,

c. a substantially continuous, elongated length of thin-wall material
1. extending between and interconnecting said proximal edge with said distal edge,
2. comprising an outer peripheral surface and an inner peripheral surface, and a total thickness therebetween of between about 0.1 millimeters and 1 millimeter, and
3. defining an elongated substantially continuous fluid flow zone
i. commencing at said first portal zone,
ii. terminating at said second portal zone, and
iii. peripherally surrounded and defined by said inner peripheral surface, and
d. conduit-engaging and postion-anchoring means formed on the outer peripheral surface of said body;



B diffusing thereapeutic medication throughout the body for retention therein and subsequent delivery to the desired site; and

C. implanting the medication delivery vehicle in the desired fluid-carrying conduit with the conduit-engaging and position-anchoring reans thereof in secure, abutting locking engagement with the walls of the conduit, preventing unwanted movement of said vehicle, and with the continuous surface thereof being in aligned, cooperating relationship with said conduit,

whereby a medication delivery vehicle is attained which assures the delivery of medication directly to a particular desired organ or site, effectively and efficiently, delivering the medication directly to a particular site, without interfereing with normal fluid flow through the conduit, and which is securely lockingly engaged in the precisely desired position.

4,678,467

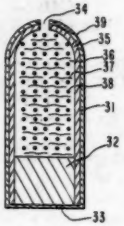
DISPENSER COMPRISING CAPSULE WITH VOLUME DISPLACING MEMBER

James B. Eckenhoff; Felix Theeuwes, both of Los Altos, and Joseph C. Deters, Mountain View, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 591,824, Mar. 21, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,351

Int. Cl.[4] A61K *9/22*

U.S. Cl. 604—892 **2 Claims**



1. A dispenser for delivering a beneficial agent formulation to a biological environment of use, wherein the dispenser comprises:

(a) a capsule member comprising a wall comprised of a gelatin composition that surrounds an internal compartment;

(b) an opened mouth in the wall of the capsule;

(c) means for absorbing fluid positioned in the mouth of the capsule, said means, when the dispenser is in operation in the biological environment, imbibing fluid, increasing in volume and expanding into the internal compartment;

(d) a wall surrounding the exterior of the capsule member, said wall comprising in at least a part a semipermeable polymeric composition permeable to the passage of fluid and substantially impermeable to the passage of a beneficial agent; and,

(e) a passageway in the wall and in the capsule distant and separate from the opened mouth and out of contact with the means for absorbing fluid for connecting the internal compartment with the exterior of the dispenser.

4,678,468

CARDIOVASCULAR PROSTHESIS

Toshiki Hiroyoshi, Yao, Japan, assignor to Bio-Medical Co., Ltd., Japan

Filed Aug. 5, 1985, Ser. No. 762,168

Claims priority, application Japan, Aug. 7, 1984, 59-165090

Int. Cl.[4] A61F *2/06*

U.S. Cl. 623—1 **11 Claims**

1. A cardiovascular prosthesis, wherein at least a part of its blood contact surface is formed by a polymer composition comprising a water soluble polymer and a crosslinked polysiloxane, at least a part of said water soluble polymer being entangled or intertwisted into polysiloxane networks.

4,678,469

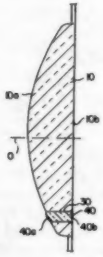
INTRAOCULAR LENS WITH GLARE-INHIBITING CLOSURE, THE METHOD OF INHIBITING GLARE, AND THE CLOSURE FOR SAME

Charles D. Kelman, 269 Grand Central Parkway, Floral Park, N.Y. 11005

Filed Oct. 20, 1986, Ser. No. 921,222

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 **19 Claims**



1. In an intraocular lens adapted to be inserted into an eye, a lens body for focusing light on the retina, said lens body comprising:

anterior and posterior optically polished surfaces shaped to focus, on the retina of the eye, light rays entering the eye,

a through bore extending from one to the other of said surfaces, said through bore adapted to receive therein the tip of a surgical instrument used to manipulate the lens body within the eye, and

plug means adapted to be removably received in said bore after the lens is seated in the eye, said plug means being at least semi-opaque for preventing light rays from passing through the bore toward the retina in a recognizable form when said plug means is received therein, whereby the glare effect otherwise experienced as a result of light rays passing through such bore, adjacent to light rays passing

through the portion of the lens body immediately surrounding said bore, is, at least substantially, reduced.

4,678,470

BONE-GRAFTING MATERIAL

Aws S. Nashef, Costa Mesa, and Todd D. Campbell, Corona, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 29, 1985, Ser. No. 738,993
Int. Cl.[4] A61F *2/00*
U.S. Cl. 623—16 **27 Claims**

1. A method of preparing a biocompatible, stable, and non-antigenic bone grafting material from allogenic or xenogenic bone stock comprising

(a) machining a bone segment to the desired dimensions

(b) tanning the bone segment by treating it with glutaraldehyde under tanning conditions.

4,678,471

METHOD AND APPARATUS FOR PREVENTING ROTATIONAL FAILURE OF ORTHOPEDIC ENDOPROSTHESES

Philip C. Noble, 2601 S. Braeswood, #103, Houston, Tex. 77025; Hugh S. Tullos, 2151 Troon Rd., Houston, Tex. 77019, and John P. Davidson, 10823 Emery Dr., Houston, Tex. 77099

Filed Aug. 22, 1985, Ser. No. 768,284
Int. Cl.[4] A61F *2/28*
U.S. Cl. 623—16 **5 Claims**

1. A method for reducing the risk of rotational failure of a prosthesis positioned in the medullary canal of a bone, comprising:

making a groove in the medullary canal surface of a bone; and

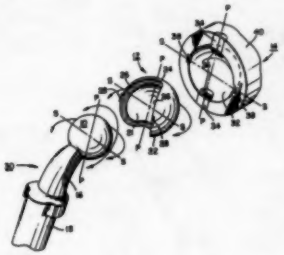
inserting into the medullary canal a prosthesis securable in a desired position using the groove in the medullary canal bone surface thereby reducing the risk of rotational prosthetic failure.

4,678,472

BALL AND SOCKET BEARING FOR ARTIFICIAL JOINT

Douglas G. Noiles, New Canaan, Conn., assignor to Joint Medical Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 473,431, Mar. 8, 1983, Pat. No. 4,642,123. This application Nov. 21, 1983, Ser. No. 553,520
The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.
Int. Cl.[4] A61F *2/30*
U.S. Cl. 623—1.8 **8 Claims**



1. A ball and socket joint for implantation in a patient's body comprising a ball portion and a socket portion,

the ball portion including:

a ball; and

first fixation means for attachment to a first bony structure, said fixation means being connected to said ball; and

the socket portion including:

a bearing for receiving the ball;

second fixation means for attachment to a second bony structure, said second fixation means having a cavity for receiving the bearing, said cavity having an opening defining a plane through which the bearing enters the cavity; and

means for securing the bearing to the second fixation means in any one of a plurality of selectable orientations after the second fixation means has been attached to the second bony structure, said plurality of selectable orientations being angularly displace from one another about an axis which is perpendicular to the plane defined by the opening of the cavity of the second fixation means;

the bearing being non-symmetric with regard to rotation about said axis and said lack of symmetry making at least one of the selectable angular orientations of the bearing more preferred for physiological reasons than others of said angular orientations, said means for securing allowing said bearing to be secured to said second fixation means in such a preferered orientation after said second fixation means has been attached to the second bony structure.

4,678,473

ARLYSULFONIUM CELLULOSIC FIBERS SUBSTANTIVE TO MANY DYE CLASSES

Tyrone L. Vigo, New Orleans, and Eugene J. Blanchard, Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 3, 1986, Ser. No. 903,173
Int. Cl.[4] D06M *13/28;* G06P *5/22*
U.S. Cl. 8—480 51 Claims

1. A process for producing cellulosic fibers which are substantive to diverse dye classes comprising:

(a) immersing cellulosic fibers into a solution of aqueous alkali metal hydroxide of sufficient concentration for sufficient time and temperature to convert the cellulosic fibers to alkali metal cellulosate; then,

(b) reacting the alkali cellulosic fiber with a sufficient amount of an aqueous solution of thioarylsulfonium salts of sufficient concentration and temperature for sufficient time to produce a modified cellulosic fiber which is substantive to dyes of diverse classes.

4,678,474

METHOD FOR IMPROVING COLOR FASTNESS OF REACTIVE DYES ON CELLULOSE WITH ALLYLAMINE COPOLYMER

Toshio Ueda; Kenji Kageno, both of Koriyama, and Susumu Harada, Tokyo, all of Japan, assignors to Nitto Boseki Co., Ltd, Fukushima, Japan

Filed Mar. 27, 1986, Ser. No. 844,809
Claims priority, application Japan, Apr. 1, 1985, 60-68795
Int. Cl.[4] D06P *5/08;* C09B *62/00*
U.S. Cl. 8—543 4 Claims

1. A method for improving the color fastness of a dyed cellulosic fiber having been dyed with a reactive dye which comprises treating the dyed product with a copolymer of an N-substituted secondary allylamine derivative represented by the following general formula:

$$CH_2{=}CH{-}CH_2{-}NH{-}R \cdot HX$$

wherein R represents a hydrocarbon group or a substituted hydrocarbon group and HX represents an inorganic or organic acid, and allylamine, diallylamine or dimethyldiallylammonium chloride.

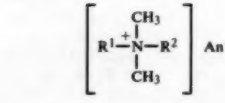
4,678,475

DYE-CONDITIONER COMPOSITION THAT IS NON-STAINING TO SKIN CONTAINING A CERTIFIED VIOLET DYE AND A QUATERNARY AMMONIUM COMPOUND

Myra A. Hoshowski, Addison, and Chaitanya Patel, Hanover Park, both of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

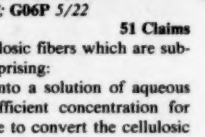
Filed Jan. 21, 1986, Ser. No. 820,124
Int. Cl.[4] A61K *7/13;* D06P *1/642, 3/14*
U.S. Cl. 8—606 20 Claims

1. A hair dye composition comprising a tinctorially effective amount of a Certified Violet dye and a quaternary ammonium compound of the formula:



wherein An^- is any anion and R^1 and R^2 are the same or different straight chain alkyl radicals C_nH_{2n+1} wherein n is predominantly 12 to 16, wherein the quaternary ammonium compound is included in the composition in an amount sufficient to prevent the Violet dye from visibly staining skin.

20. A method of reducing yellowing of yellowed human hair with a violet dye-containing composition without substantial visible skin coloration comprising contacting human hair with a composition containing a liquid carrier; a tinctorially effective amount of a violet dye; and a di-fatty quaternary ammonium compound of the formula



wherein An^- is any anion and R^1 and R^2 are the same or different straight chain alkyl radicals C_nH_{2n+1} wherein n is at least 12, wherein the quaternary ammonium compound is included in the composition in an amount sufficient to prevent the Violet dye from visibly staining skin.

4,678,476

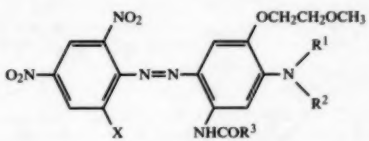
MIXTURES OF BLUE MONO-AZO DISPERSE DYESTUFFS AND THEIR USE FOR DYEING POLYESTER

Horst Tappe, Dietzenbach; Hubert Kruse, Kelkheim; Reinhard Kühn, Frankfurt; Albert Bode, Schwalbach, and Margareta Boos, Hattersheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 911,746
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539771
Int. Cl.[4] C09B *67/22, 29/00;* D06P *1/04*
U.S. Cl. 8—639 11 Claims

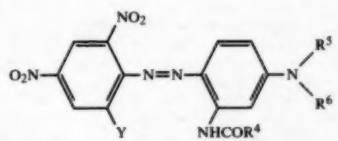
1. Dyestuff mixture containing at least two separate dyestuffs (I) and (II) in a weight ratio of (I):(II) of from (20 to 99):(80:1) wherein:

(I) is at least one dyestuff of the formula



and

(II) is at least one dyestuff of the formula



in which

X and Y are the same or different and each is independently chloro or bromo:

R^1 and R^2 are the same or different and each independently denotes hydrogen, alkoxy having 1 to 4 carbon atoms, alkenyl having 3 or 4 carbon atoms, cyclohexyl, benzyl, chlorobenzyl, bromobenzyl, nitrobenzyl, cyanobenzyl, alkylbenzyl having 1 to 4 carbon atoms in the alkyl moiety, alkoxybenzyl having 1 to 4 alkoxy carbon atoms, alkyl having 1 to 11 carbon atoms, alkyl having 1 to 11 carbon atoms interrupted by 1 to 3 oxygen atoms or substituted alkyl having 1 to 11 carbon

atoms wherein the substituent is one selected from the group consisting of chloro, bromo, cyano, phenyl, phenoxy, hydroxy, (C_1-to-C_4-alkyl)-carbonyloxy; (C_1-to-C_4-alkoxy)-carbonyl, phenylcarbonyloxy, (C_3-to-C_5-alkenyloxy)-carbonyloxy, (C_1-to-C_4-alkoxy)-carbonyloxy, phenoxycarbonyloxy, tetrahydrofurfuryl, (C_1-to-C_4-alkyl)-tetrahydrofurfuryl, tetrahydrophyronyl and (C_1-to-C_4-alkyl)-tetrahydropyronyl;

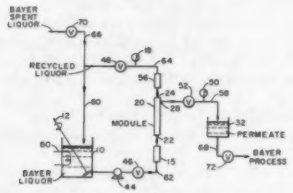
R^3 and R^4 are the same or different and each is independently methyl, ethyl, n-propyl or i-propyl;

R^5 and R^6 are the same or different and each is independently one of the definitions of R^1 and R^2 excepting hydrogen.

4,678,477
PROCESS FOR LOWERING LEVEL OF CONTAMINANTS IN BAYER LIQUOR BY MEMBRANE FILTRATION

Paul J. The, Murrysville, and Chanakya Misra, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 6, 1986, Ser. No. 816,242
Int. Cl.[4] B01D *13/01*
U.S. Cl. 23—305 A **19 Claims**



MEMBRANE ULTRAFILTRATION FLOW SHEET

1. A method for purification of a caustic sodium aluminate solution to remove impurities comprising organic carbon, humate, and sodium oxalate therefrom which comprises bringing the caustic solution into contact with the outside of a plurality of coated porous hollow polysulfone fibers and collecting purified solution from an open end of the hollow fibers.

4,678,478
METHOD FOR DESULFURIZATION OF COAL

David R. Kelland, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 14, 1986, Ser. No. 851,924
Int. Cl.[4] C10L *9/00, 9/04*
U.S. Cl. 44—1 SR **16 Claims**

1. A method for treating coal which consists of organic carbonaceous material and inorganic minerals to substantially remove sulfur therefrom comprising the steps of:

(a) pulverizing the coal to liberate some of the inorganic minerals from the coal;

(b) heating the pulverized coal to convert some of the sulfur in the inorganic minerals from the pyrite form of iron sulfide to the more catalytic form of troilite or pyrrhotite;

(c) reacting the heated coal with a chemical agent containing elements which, in the presence of said catalytic forms of iron sulfide, combine with the sulfur to remove some of the sulfur from the organic material as gaseous compounds of sulfur; and

(d) separating the remaining inorganic iron sulfides, now predominantly in the relatively higher magnetic form of pyrrhotite or troilite, by a magnetic separation process.

2. The method of claim 1 including the steps of treating the coal from Step (c) with a flocculating agent prior to the magnetic separation of Step (d) to associate non-pyritic minerals in the coal with the pyrrhotite or troilite forms.

3. The method of claim 1 wherein the heating in Step (b) is a preferential heating of the inorganic sulfur in the presence of a flowing gas.

4. The method of claim 1 wherein one of the elements of the chemical agent is hydrogen.

4,678,479
DIESEL FUEL COMPOSITION

Robert T. Holmes, 318 Hickory Post, Houston, Tex. 77079; Terence M. Evans, 8, Redhill Road, Kelsall, Tarporley, Cheshire CW6 0QP, United Kingdom; Keith King, 90, Green Lane, Vicars Cross, Chester, Cheshire CH3 5LE, United Kingdom, and Leonard B. Graiff, Gatesheath Hall, Tattenhall, Chester, Cheshire CH3 9AH, United Kingdom

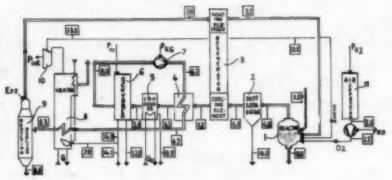
Filed Apr. 11, 1986, Ser. No. 850,658
Claims priority, application United Kingdom, Apr. 24, 1985, 8510450
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—57 **16 Claims**

1. A diesel fuel composition comprising a hydrocarbonaceous diesel fuel having a cetane number in the range of from 25 to 60, a polyolefin comprised of C_3-, C_4-, or C_3-and C_4 olefins and a polyamine wherein at least one hydrocarbon chain has at least 25 carbon atoms bound directly to a nitrogen atom of said polyamine.

4,678,480
PROCESS FOR PRODUCING AND USING SYNGAS AND RECOVERING METHANE ENRICHER GAS THEREFROM

Peter Heinrich, Oberhausen; Klaus Knop, Geldern, and Friedbert Rübe, Munich, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

Filed Oct. 23, 1985, Ser. No. 790,325
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439487
Int. Cl.[4] C10J *3/46, 3/59;* **C22B** *5/12*
U.S. Cl. 48—197 R **2 Claims**



1. A method of producing and using a high quantity of high grade syngas with very little power consumption, and using a gasification reactor a fuel containing carbon materials and producing a methane plus carbon dioxide containing syngas as a product and also using a 4-pole heat exchanger having two inputs and two outputs, a condenser, a regenerator having a cooling element and a heating element, and a PSA scrubber, comprising: passing the syngas from the gasification reactor to the cooling element of the regenerator for cooling the syngas; passirg the cooled syngas into one of the inputs of the 4-pole heat exchanger and out through one of the outputs of the 4-pole heat exchanger for further cooling the cooled syngas; passing the further cooled syngas through the condenser for removing condensate from the further cooled syngas to produce a dry syngas; subjecting the dry syngas to scrubbing in the scrubber two remove separate portions of gas, one portion being high in methane and the other portion being high in carbon dioxide, and a hydrogen rich syngas leaving the scrubber; passing the hydrogen rich syngas through the other input of the 4-pole heat exchanger and out through the other output of the 4-pole heat exchanger for heating the hydrogen rich syngas to produce a heated hydrogen rich syngas subjecting

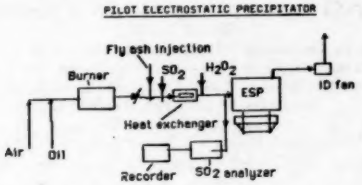
the heated hydrogen rich syngas to a partial oxidation in an ore reduction reaction to produce a waste gas, passing the waste gas through a heating element of the regenerator for heating the waste gas, and supplying the heated waste gas to the gasification reactor to react with the fuel containing carbon material, and wherein the heated hydrogen rich syngas is supplied to a steam generating heater to be further heated thereby before the heated hydrogen rich syngas is supplied to the ore reduction reactor and supplying some of the one portion of gas which is high in methane, as fuel, to the steam generating heater for generating steam.

4,678,481

H_2O_2 AS A CONDITIONING AGENT FOR ELECTROSTATIC PRECIPITATORS

Daniel V. Diep, Aurora, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 2, 1986, Ser. No. 902,847
Int. Cl.[4] B03C *3/01*
U.S. Cl. 55—4 **1 Claim**



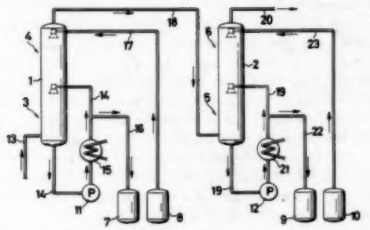
1. A method of improving the efficiency of electrostatic precipitators for removing high resistivity particulate matter from flue gases by treating said flue gases prior to contact with the electrostatic precipitator with an aqueous solution of hydrogen peroxide with the ratio of hydrogen peroxide to SO_3 being on a weight basis of at least 0.5/1.

4,678,482

PROCESS FOR PURIFYING HYDROGEN CHLORIDE GAS

Heinz Müller, Brühl; Elmar Lohmar, Cologne, and Harald Scholz, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,013
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1986, 3526801
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—71 **8 Claims**



1. A process for decontaminating prepurified hydrogen chloride gas in two countercurrent scrubbing zones series-connected together, the hydrogen chloride gas obtained as a by-product in the production of chloroacetic acid by subjecting acetic acid to a catalytic chlorination reaction with chlorine gas in the presence of acetic anhydride and/or acetyl chloride, and prepurified still containing 0.1–3 vol % acetyl chloride and up to 0.1 vol % chloroacetyl chloride, which comprises: scrubbing the hydrogen chloride gas in the first scrubbing zone with concentrated hydrochloric acid and in the second scrubbing zone with concentrated sulfuric acid.

4,678,483

METHODS OF PARTICULATE MEASUREMENT

Michael J. Dolan, Laurel Springs; Timothy L. Hilbert, Clementon, both of N.J., and John D. Snyder, Pittsburgh, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 336,010
Int. Cl.[4] G01N *33/00*
U.S. Cl. 55—97 **3 Claims**

1. A method of pretreating a filter of a corrosion- and heat-resistant material used to collect particulates from a process stream comprising SO_3/H_2SO_4, said filter comprising substances which react chemically with components of said process stream, comprising the step of:

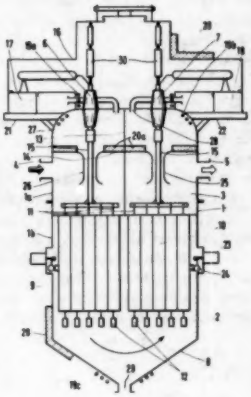
pretreating the filter by exposure to H_2SO_4 prior to exposure to said process stream, whereby said reactions take place prior to exposure of the filter to the process stream.

4,678,484

ELECTROFILTER

Wolfgang Hartmann, Frankfurt am Main, and Paul G. Gocht, Mörfelden/Walldorf, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,175
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524861
Int. Cl.[4] B03C *3/76*
U.S. Cl. 55—112 **15 Claims**



1. An electrofilter for the removal of dust from a gas at a pressure of up to 30 bar and a temperature up to 500° C., comprising:

a vertically extending, gas tight cylindrical pressure vessel having an upper and a lower chamber, said lower chamber having a conically tapered dust collecting hopper and housing a plurality of precipitating electrodes and a corresponding number of spray electrodes in said lower chamber, the spray electrodes being disposed within said precipitating electrodes; insulators disposed in said upper chamber;

separating means for separating a gas entry side from a gas exit side of the vessel;

gas inlet and gas outlet means in said upper chamber so as to direct the gas through the electrodes of the gas entry side

from top to bottom and cause the gas to flow through the electrodes of the gas exit side from the bottom to top;

support means for supporting said spray electrodes;

a structure with openings for the support means of the spray electrodes, said structure shielding said insulators from said gas in the upper chamber; and

gas-tight means for housing voltage-carrying parts between a high-voltage system and the insulators.

4,678,485

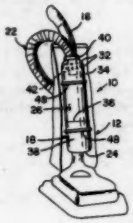
VACUUM CLEANER EXHAUST DUST COLLECTOR

Martha N. Finley, 1058 Boston Ave., Nederlands, Tex. 77627, and George Spector, 233 Broadway Rm. 3615, New York, N.Y. 10007

Filed Jan. 27, 1986, Ser. No. 823,076

Int. Cl.[4] B01D *47/02, 50/00*

U.S. Cl. 55—255 **4 Claims**



1. In a standard upright vacuum cleaner having an exhaust pipe, and an elongated handle, the improvement comprising a dust collector including:

(a) a cylindrical elongated tank holding water therein, said tank having a bottom wall, a side wall and an externally threaded neck having an open top, said side wall having a plurality of air exhaust holes at an upper portion near said neck and an external line indicating proper water level at a lower portion of said tank;

(b) means for attaching said tank to said vacuum cleaner; and

(c) a flexible elongated hose having a screw cap near one end and a retainer clamp formed at the other end, said screw cap threadably engages to said neck with a portion of said hose extending within said tank while said retainer clamp fits over said exhaust pipe of said vacuum cleaner allowing dust particles to be caught in said water within said tank whereby air exhausted through said exhaust holes will be dust free.

4,678,486

VACUUM CLEANER HOUSING AND DUST BAGS THEREFOR

Gernot Jacob, Weissach-Flacht, and Leon Radom, Ellhofen, both of Fed. Rep. of Germany, assignors to Progress-Elektrogeräte Maux & Pfeiffer GmbH & Co., Nürtingen, Fed. Rep. of Germany

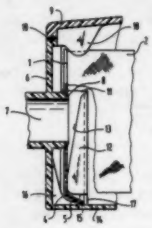
Filed Oct. 10, 1985, Ser. No. 786,278

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3437867

Int. Cl.[4] B01D *46/02*

U.S. Cl. 55—374 **20 Claims**

20. A dust bag including a board flange having an air inlet opening for operative engagement with the suction port of a vacuum cleaner housing in a manner so that dust may be received through the suction port and into the dust bag, said board flange having a section adapted to fit within the vacuum cleaner housing so as to be lower down than the rest of said



board flange, said section having a prepared line of bending parallel to a lower edge of said board flange.

4,678,487

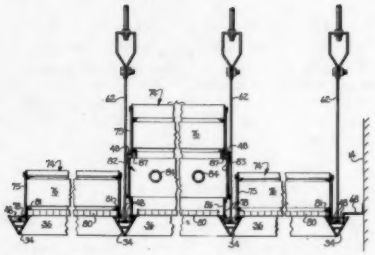
LAMINAR FLOW CLEAN ROOM HAVING IMPROVED FILTER BANK

George H. Cadwell, Jr., Blounts Creek; Clarence B. Pittman, Pinetown, and Cecil W. Bowers, Washington, all of N.C., assignors to Flanders Filters, Inc., Washington, N.C.

Filed May 14, 1985, Ser. No. 733,972

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—385 A **16 Claims**



1. A clean room having provision for supplying filtered air vertically therethrough under substantially laminar flow conditions, and comprising

a clean room enclosure including a top wall, a bottom wall, and bounding side walls,

a filter bank positioned parallel to and spaced below said top wall, said filter bank comprising

(a) a supporting latticework composed of a plurality of interconnected members which define a plurality of rectangular open areas, said members of said latticework including a plurality of parallel, laterally spaced apart lengthwise members, and a plurality of cross members extending laterally between the lengthwise members, with said lengthwise and cross members each comprising a pair of outer side walls and an internal plate extending horizontally between the side walls to define an upwardly open receptacle, and with the ends of said cross members abutting said lengthwise members at a location intermediate the ends thereof to define a right angled interconnection therebetween, with each such interconnection including a cut-out section in the side wall of the lengthwise member which extends downwardly to the level of the associated plate and laterally a distance conforming to the separation of the adjacent portion of the side walls of the associated cross member and such that the receptacles and plates of the lengthwise and cross members are coextensive about the periphery of each open area, and with each of said interconnections further including a retainer means interconnecting the end of the cross member and the associated

lengthwise member and which includes an opening extending through the side wall of the associated lengthwise member below the associated internal plate, and a retainer extending outwardly from the end of the associated cross member and through said opening,

(b) a plurality of high efficiency air filters positioned on said interconnected members of said supporting latticework, with the filters covering respective ones of said open areas,

(c) a sealant disposed within the receptacles and upon the coextensive plates of said lengthwise and cross members of said latticework and continuously about the periphery of each open area, and so that the sealant is interposed between said members of said latticework and the periphery of each of said filters to form a seal therebetween, and

means for introducing air above each of said filters of said filter bank such taht the air flows downwardly through said filters at a predetermined flow rate.

7. A clean room having provision for supplying filtered air vertically therethrough under substantially laminar flow conditions, and comprising

a clean room enclosure including a top wall, a bottom wall, and bounding side walls,

a filter bank positioned parallel to and spaced below said top wall, said filter bank comprising

(a) a supporting latticework composed of a plurality of interconnected members which define a plurality of rectangular open areas, said members of said latticework including a plurality of parallel, laterally spaced apart lengthwise members, and a plurality of cross members extending laterally between the lengthwise members, with said lengthwise and cross members each comprising a pair of outer side walls, an internal plate extending horizontally between the side walls to define an upwardly open receptacle, and a post extending upwardly a relatively short distance from the medial portion of said internal plate and along at least a substantial portion of the length of the member, said post including an upper portion which is wedge shaped in cross section, and with the ends of said cross members abutting said lengthwise members at a location intermediate the ends thereof to define a right angled interconnection therebetween, with each such interconnection including a cut-out section in the side wall of the lengthwise member which extends downwardly to the level of the associated plate and laterally a distance conforming to the separation of the adjacent portion of the side walls of the associated cross member and such that the receptacles and plates of the lengthwise and cross members are coextensive about the periphery of each open area, and each of said interconnections including retainer means grippingly engaging the posts of the associated members to interconnect the same, each of said retainer means comprising a unitary member having an enclosed outline in cross section which includes a longitudinal split bottom wall which is adapted to be spread apart upon the retainer being pressed downwardly onto the wedge shaped upper portion of said post and so as to permit said member to be readily assembled onto the post in a surrounding relationship,

(b) a plurality of high efficiency air filters positioned on said interconnected members of said supporting latticework, with the filters covering respective ones of said open areas, and

(c) a sealant disposed within the receptacles and upon the coextensive plates of said lengthwise and cross members of said latticework and continuously about the periphery of each open area, and so that the sealant is interposed between said members of said latticework and the periphery of each of said filters to form a seal therebetween, and

means for introducing air above each of said filters of said filter bank such that the air flows downwardly through said filters ata a predetermined flow rate.

10. A clean room having provision for supplying filtered air vertically therethrough under substantially laminar flow conditions, and comprising

a clean room enclosure including a top wall, a bottom wall, and bounding side walls,

a filter bank positioned parallel to and spaced below said top wall, said filter bank comprising

(a) a supporting latticework composed of a plurality of interconnected members which define a plurality of rectangular open areas, said members of said latticework including a plurality of parallel, laterally spaced apart lengthwise members, and a plurality of cross members extending laterally between the lengthwise members, with said lengthwise and cross members each comprising a pair of outer side walls disposed in a generally V-shaped arrangement in cross section and an internal plate extending horizontally between the side walls and such that each member has the general form of an inverted A in cross section, and defines an upwardly open receptacle, and with the lengthwise members and cross members defining a plurality of generally X-shaped interconnections within the interior of the latticework composed of the ends of two aligned cross members abutting an associated lengthwise member at a location intermediate its ends, and wherein each of said generally X-shaped interconnections in the interior of the latticework includes a cut-out section in each of the side walls of the lengthwise member which extends downwardly to the level of the associated plate and laterally a distance conforming to the separation of the adjacent portion of the side walls of the associated cross member and such that the receptacles and plates of the lengthwise and cross members are coextensive about the periphery of each open area, and each of said generally X-shaped interconnections further comprises retainer means interconnecting the associated cross members and lengthwise member,

(b) a plurality of high efficiency air filters positioned on said interconnected members of said supporting latticework, with the filters covering respective ones of said open areas,

(c) a sealant disposed within the receptacles and upon the coextensive plates of said lengthwise and cross members of said latticework and continuously about the periphery of each open area, and so that the sealant is interposed between said members of said latticework and the periphery of each of said filters to form a seal therebetween, and

means for introducing air above each of said filters of said filter bank such that the air flows downwardly through said filters at a predetermined flow rate.

16. A clean room having provision for supplying filtered air vertically therethrough under substantially laminar flow conditions, and comprising

a clean room enclosure including a top wall, a bottom wall, and bounding side walls,

a filter bank positioned parallel to and spaced below said top wall, said filter bank comprising

(a) a supporting latticework composed of a plurality of interconnected members which define a plurality of rectangular open area, said members of said latticework including a plurality of parallel, laterally spaced apart lengthwise members, and a pluraity of cross members extending laterally between the lengthwise members, with said lengthwise and cross members each comprising a pair of outer side walls and an internal plate extending horizontally between the side walls to define an upwardly open receptacle, and with the ends of said cross members aubtting said lengthwise members at a location intermediate the ends thereof to define a right angled interconnection therebetween, with each such interconnection including a cut-out section in the side wall of the lengthwise member which extends downwardly to the level of the associated plate and laterally a distance conforming to the separation of the adjacent portion of the side walls of the associated cross member and such that the receptacles and plates of the lengthwise and cross members are coextensive about

the periphery of each open area, and each of said interconnections further including retainer means interconnecting the ends of the cross member and the associated lengthwise member, and wherein the side walls of said lengthwise and cross members are inclined so that the side walls and internal plate have the general form of an inverted A in cross section,

(b) a plurality of high efficiency air filters positioned on said interconnected members of said supporting latticework, with the filters covering respective ones of said open areas,

(c) a sealant disposed within the receptacles and upon the coextensive plates of said lengthwise and cross members of said latticework and continuously about the periphery of each open area, and so that the sealant is interposed between said members of said latticework and the periphery of each of said filters to form a seal therebetween, and

means for introducing air above each of said filters of said filter bank such that the air flows downwardly through said filters at a predetermined flow rate.

4,678,488

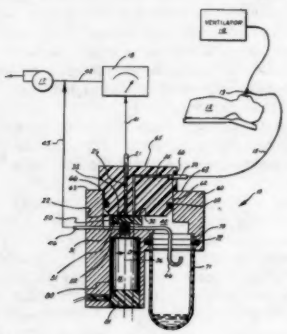
LIQUID SEPARATOR FOR GAS ANALYZER

Charles P. Howard, Ann Arbor, Mich., and Donald H. Stedman, Englewood, Colo., assignors to Sensors, Inc., Saline, Mich.

Filed May 2, 1985, Ser. No. 729,635

Int. Cl.[4] B01D *45/14*

U.S. Cl. 55—406 **15 Claims**



1. A liquid separator having a small gas flow rate for a gas analyzer comprising:

a housing;

a sample gas inlet disposed in said housing;

a sample gas outlet disposed in said housing;

a separation chamber disposed within said housing, said separation chamber being in fluid communication with said gas inlet and said gas outlet, said separation chamber having a smooth, planar first wall disposed in said housing and a smooth planar second wall disposed on a rotatable member journaled in said housing, said first and second walls being substantially parallel and having a small uniform clearance therebetween;

a motor means disposed in said housing and connected to said rotatable member for imparting a rotational velocity to said second wall about a central axis normal to said planar first and second walls;

said gas outlet being disposed on said central axis is said first wall;

said gas inlet being positioned in said first wall with an offset from said central axis

a pump means for establishing a vacuum, said pump means being in flow communication with said sample gas outlet for drawing sample gas through said separation chamber;

a collection chamber disposed on said housing surrounding said separation chamber, said collection chamber being positioned to receive liquids and other debris separated by contact with said second wall and centrifugal acceleration imparted thereto by rotation of said second wall;

said pump means being in flow communication with said collection chamber for applying a vacuum thereto;

a removable liquid sump disposed below and in fluid communication with said collection chamber.

4,678,489

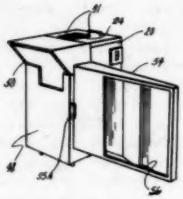
FILTERING SYSTEM FOR PAPER HANDLING MACHINES

John C. Bertelsen, 3060 Baker Rd., Dexter, Mich. 48130, assignor to John C. Bertelsen, Dexter, Mich.

Continuation-in-part of Ser. No. 517,903, Jul. 28, 1983, abandoned, and a continuation-in-part of Ser. No. 708,649, Mar. 6, 1985, Pat. No. 4,563,943, which is a continuation-in-part of Ser. No. 443,122, Nov. 19, 1982, abandoned. This application Jul. 29, 1985, Ser. No. 759,757

Int. Cl.[4] B01D *46/42*

U.S. Cl. 55—418 **1 Claim**



1. Filter means for removing paper dust, carbon black and the like from air being discharged in a first direction from a high-speed paper handling machine, comprising:

a housing having a top opening and a lower inlet opening;

a cover having a grille for passing filtered air from the housing, the cover being removably mounted on said top opening;

an electrically energized squirrel cage fan;

elongated fastener means having their upper ends connected to the cover and their lower ends connected to the fan such that the fan is suspended solely from the cover when the cover is mounted on said top opening, the fastener means and the fan being removable together with the cover from the housing, the fan being operative to move air from the paper handling machine toward the grille;

filter pack means for removing material from air passing therethrough, said filter means being mounted in the housing between the grille and the lower inlet opening and including:

filtering media in a four-sided unit;

frame means including first, second, third and fourth elongated frame members, each of said frame members having a length generally corresponding to the length of a side of said unit;

first hinge means connecting the first frame member to the second frame member;

second hinge means connecting the second frame member to the third frame member;

third hinge means connecting the third frame member to the fourth frame member;

means for releasably connecting the fourth frame member to the first frame member to form a frame assembly in which each frame member is movable with respect to the other three of the frame members between an open position for receiving the filtering media, and a closed position in which the frame members are each disposed side-by-side with a corresponding side of the four-sided unit to engage the four sides of the filtering media unit such that the filtering media is disposed to filter air being passed from the lower inlet opening toward the grille by the fan;

an elongated hollow duct hingedly mounted on the housing

for guiding air from the paper handling machine to the filter housing, the duct having an inlet opening at one end thereof, and an outlet opening at the opposite end thereof adjacent the lower inlet opening of the housing for passing air from the duct to the housing, the duct inlet opening having a first cross-section, and the duct outlet opening having a lesser cross-sectional area than the cross-section of the inlet opening, the duct inlet opening being disposed for receiving air along a path generally at right angles to the longitudinal axis of the duct, the duct having a midsection between the duct inlet opening and the duct outlet opening for receiving air from the paper handling means and passing it through the duct midsection toward the duct outlet opening;

an elongated baffle member mounted within the duct parallel to the longitudinal axis of the duct;

the baffle member having an inlet edge disposed to divide the duct inlet opening into a first section and a second section, the area of the cross-section of the first section being greater than the area of the cross-section of the second section, and the first section being disposed between the second section and the duct outlet opening;

the baffle member having a downstream section between the duct inlet opening and the duct outlet opening disposed in a plane transverse to said first air direction;

whereby as the air enters the duct inlet opening, it changes direction from said first direction toward said second direction as it moves downstream from the inlet opening toward the duct outlet opening.

4,678,490

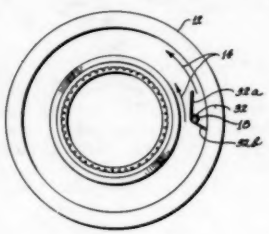
APPARATUS FOR FORMING FIBERS

Charles H. Miller; Kunihiko Takeuchi, both of Newark, and Paul A. Goodridge, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 24, 1985, Ser. No. 791,000

Int. Cl.[4] C03B *37/04*

U.S. Cl. 65—14 **12 Claims**



1. An apparatus for forming fibers from a liquid, said apparatus comprising:

a. a rotatable spinner for generating fibers from a liquid supplied thereto, and

b. an annular blower for pneumatically influencing fibers generated by said spinner, said blower comprising:

(1) an annular casing surrounding said spinner and defining an annular chamber;

(2) a gas inlet port in said casing for supplying a gas to said annular chamber, said gas when supplied normally tending along paths in said annular chamber in opposite arcuate directions from said inlet port whereby turbulence is generated in said annular chamber at a juncture of said paths diametrically opposite said inlet port;

(3) an annular gas outlet port in said casing in surrounding relationship to said spinner, said gas when supplied emerging from said gas outlet port to pneumatically influence said fibers, and

(4) a baffle in said annular chamber directing at least a major portion of said gas in one arcuate direction in said annular chamber when gas is supplied to said inlet port and thereby reducing turbulence in said annular chamber.

4,678,491

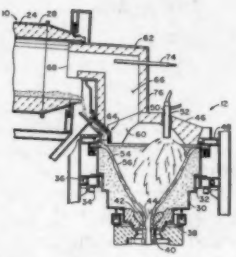
REDUCTION OF MATERIAL BUILDUP BY MEANS OF GAS JET

Yih-Wan Tsai, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 18, 1985, Ser. No. 799,227

Int. Cl.[4] C03B *1/00*

U.S. Cl. 65—27 **18 Claims**



1. In an apparatus for melting material having a heating means, means for preheating and moving said material toward said heating means, means interconnecting said heating means and moving means to move said material there through and into said heating means, and means for ducting exhaust gas from said heating means into said moving means, wherein entrained material in said exhaust gas leaves deposits within said duct means, the improvement comprising:

gas jet means mounted relative to said duct means and oriented so as to accelerate the flow of said exhaust gas through said duct means and into said preheating means to reduce said deposit within said duct means.

15. In a method of liquefying pulverulent batch material including the steps of moving batch material through a first heating zone, removing said material from said first heating zone and depositing said material into a second heating zone where the temperature of said material is raised to liquefy said material, and directing hot exhaust gas from said second heating zone through a transition section and into said first heating zone to expose said batch material in said first heating zone to said hot exhaust gas to preheat said batch material, wherein entrained material in said exhaust gas leaves deposits on interior surfaces of said transition sections or said first heating zone, the improvement comprising:

accelerating said exhaust gas in said transition section to alter the flow of said exhaust gas through said transition section so as to reduce buildup of material carried by said exhaust gas.

4,678,492

BLOWING PROCESS FOR EXPANDING A MOLTEN GLASS PARISON

Thomas V. Foster, Doncaster, United Kingdom, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 24, 1986, Ser. No. 821,942

Claims priority, application United Kingdom, Jan. 30, 1985, 8502371

Int. Cl.[4] C03B *9/36*

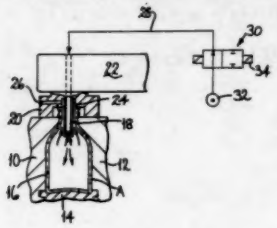
U.S. Cl. 65—74 **3 Claims**

1. A process for expanding a molten glass parison to the shape of a mold cavity in which the parison is contained, by directing air at a selected pressure into the parison to thereby form the parison into an article of glassware the supplied air being discharged from the parison comprising

continuously supplying said pressurized air into the interior

of the parison until the pressure therein increases to said selected pressure, and

thereafter, repetitively terminating said supplying of pressurized air for a duration predetermined to decrease the



pressure to a second pressure and at frequency selected so that the pressure within the parison following a termination will cycle between said selected pressure and said second pressure.

4,678,493

VITRIFICATION OF ASBESTOS WASTE

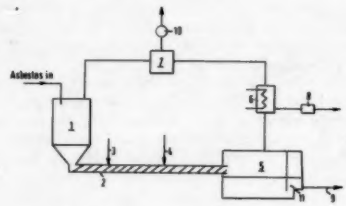
David Roberts, and Henry S. Johnson, both of Sheffield, England, assignors to King Taudevin & Gregson (Holdings) Limited, Sheffield, England

Continuation of Ser. No. 672,475, Nov. 16, 1984, abandoned. This application Aug. 25, 1986, Ser. No. 899,630

Claims priority, application United Kingdom, Nov. 21, 1983, 8331031

Int. Cl.[4] C03B *5/02*; C03C *3/087*

U.S. Cl. 65—134 **11 Claims**



1. A process for converting waste asbestos into a vitreous glass product which comprising the steps of:

providing an electrical glass melting furnace having two regions, a first region of said regions defining a closed melting chamber including means for feeding asbestos into the melting chamber and means for permitting the molten glass melt formed in said melting chamber to flow from said first region to a second region in said furnace comprising means in said furnace located between said first region and said second region for separating the furnace into said two regions capable of containing molten glass at a temperature of at least 1000° C., said two regions communicating with each other below the level of said melt;

supplying asbestos and a source of glass into said first region of said furnace;

heating said asbestos and said source of glass to form a melt;

maintaining said melt at less than atmospheric pressure, and a temperature of at least 1000° C. for a sufficient period of time to decompose the asbestos;

withdrawing the melt from said second region of the furnace at a preselected temperature of at least 1000° C. by permitting the melt to continuously flow from said first region maintained at a reduced pressure to said second region from which it is withdrawn by discharge from the said second region at atmospheric pressure;

said flow between said first and second regions being confined to flow of the melt below the surface of the melt, whereby during continuous operation of said process the restricted flow of said melt between the two regions of said furnace can occur while maintaining less than atmospheric pressure above said first region and while withdrawing a homogeneous melt from said second region containing substantially no undecomposed asbestos.

4,678,494

BLOWHEAD ARRANGEMENT FOR A GLASSWARE CONTAINER MANUFACTURING MACHINE

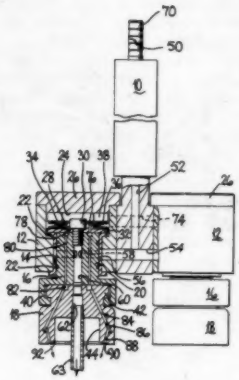
Hermann H. Nebelung, Zurich, Switzerland, and Werner-Dieter Knoth, Essen, Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Nov. 12, 1983, Ser. No. 553,941

Claims priority, application United Kingdom, Nov. 30, 1982, 8234097

Int. Cl.[4] C03B *9/14*

U.S. Cl. 65—261 **4 Claims**



1. A blowhead arrangement for a glassware container manufacturing machine comprising a blowhead support, a blowhead mounted on said support, a first passage means in said support for connection to a first supply of air under pressure, a blowing passage means in said blowhead communicating with said first passage means so that, when the blowhead is positioned in the blowing position with the blowing passage means in communication with the opening of a glass parison in a mould cavity, air from the blowing passage blows the parison into the shape of the mould cavity, second passage means in said support for connection to a second supply of air under pressure, a series of means defining cooling passages in said blowhead communicating with said second passage means, the bottom surface of said blowhead having an upward and inwardly tapering recess, said cooling passages means having openings in said recess and an end portion on said bottom surface extending from said openings outwardly perpendicular to the surface of the tapering recess whereby air leaving the cooling passages impinges on the finish of the glass container.

4,678,495

GLASS SHAPING MOLD

Hideo Yoshizawa, Kanagawa, Japan, assignor to Nippon Sheet Glass Co., Ltd., Japan

Filed Nov. 26, 1985, Ser. No. 801,786

Claims priority, application Japan, Nov. 26, 1984, 59-248967

Int. Cl.[4] C03B *11/08*

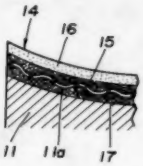
U.S. Cl. 65—287 **21 Claims**

1. A glass shaping mold comprising:

a female mold member having a shaping surface;

a male mold member having a shaping surface complementary to said shaping surface of the female mold member;

a felt sheet made of at least two different materials, said materials comprising steel fibers and composite fibers



including aramid fibers and carbon fibers, said felt sheet disposed on each of said shaping surfaces; and

said female and male mold members being movable toward each other to shape a heat-softened glass object between the felt sheets on said shaping surfaces.

4,678,496

CYCLOHEXANE DERIVATIVES HAVING PLANT-GROWTH REGULATING ACTIVITIES, AND USES OF THESE DERIVATIVES

Kenji Motojima, Kakegawa; Takeshige Miyazawa, Shizuoka; Yasufumi Toyokawa, Shizuoka; Masafumi Matsuzawa, Shizuoka; Hiroshi Hokari, Shizuoka, and Shoji Kusano, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

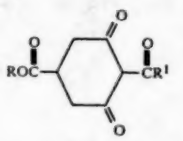
Division of Ser. No. 534,827, Sep. 22, 1983, Pat. No. 4,560,403. This application Aug. 1, 1985, Ser. No. 761,497

Claims priority, application Japan, Apr. 22, 1983, 58-71264

Int. Cl.[4] A01N *37/42, 43/10;* **C07C** *62/26, 69/757, 87/68;* **C07D** *332/24*

U.S. Cl. 71—76 **21 Claims**

1. A cyclohexane compound of the general formula:



(I)

wherein R represents a hydrogen atom or an alkyl group, an alkylthioalkyl group or a phenyl group, a $(C_1–C_4)$alkylphenyl group, a halophenyl group or a $(C_1–C_4)$alkoxyphenyl group and R^1 represents an alkyl group, a benzyl group, a $(C_1–C_4)$alkylbenzyl group, a halo-benzyl group or a $(C_1–C_4)$alkoxybenzyl group, a phenethyl group, a phenoxymethyl group, a 2-thienylmethyl group, an alkoxy-methyl group or an alkylthiomethyl group, or a salt of said cyclohexane compound.

21. A method of regulating the growth of plant, which comprises applying an effective amount of a cyclohexane compound of the formula (I) or a salt thereof as claimed in claim 1 to the foliage or seed of the plant to be treated or to the soil or locus where the plant to be treated is grown.

4,678,497

TRIAZINE-SUBSTITUTED HERBICIDAL AZOBENZENESULFONAMIDES

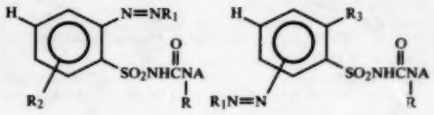
Wallace C. Petersen, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 650,188, Sep. 13, 1984, Pat. No. 4,585,470. This application Jan. 13, 1986, Ser. No. 818,133

Int. Cl.[4] A01N *9/22;* **C07C** *107/04, 113/04, 115/00*

U.S. Cl. 71—86 **12 Claims**

1. A compound of Formulae I or II

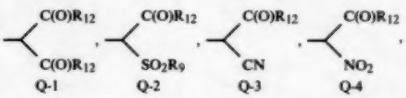


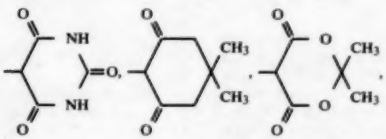
or an agriculturally suitable salt thereof, wherein:

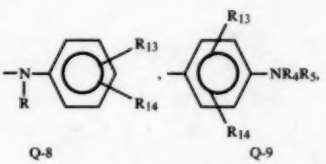
R is H or CH_3;

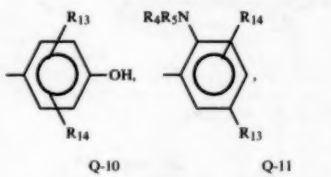
R_1 is NR_4R_5, $N(CH_3)OR_6$, NHCN, NRA, $P(W)R_4(W_1R_5)$, $P(W)(W_1R_4)(W_2R_5)$, $P^+(C_6H_5)_3$, $P^+R_6R_7R_8$, SR_9, SO_2R_9, $C(R_{10})(R_{11})NO_2$, $CH(CN)_2$ or Q;

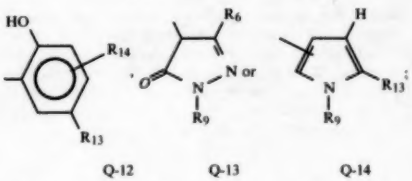
Q is









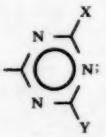


R_2 is H, F, Cl, Br, OCH_3, OC_2H_5, OCF_2H, $SCH_3N(CH_3)_2$, NO_2, CH_3 or CF_3;

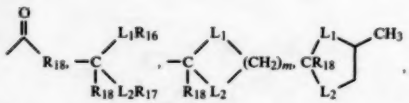
R_3 is H, F, Cl, Br, $C_1–C_4$ alkyl, CO_2R_{15}, NO_2, CF_3, $C_1–C_4$ alkoxy, $C_1–C_4$ alkylthio, $SO_2NR_{16}R_{17}$, $C_1–C_4$ alkylsulfonyl, $C_1–C_4$ haloalkoxy, $C_1–C_4$ alkylsulfonyloxy, $C_2–C_5$ alkoxyalkyl or $C_3–C_4$ alkenyloxy;

R_4 and R_5 are independently $C_1–C_4$alkyl, $C_2–C_4$alkyl substituted by 1 atom of Br or 1–3 atoms of F or Cl, $C_3–C_5$ alkenyl, $C_3–C_5$ cycloalkyl, OH, OCH_3, CH_2OH, CH_2OR_6, or $CH_2CH_2OR_6$; or

R_4 and R_5 when taken together are $-(CH_2)_4-$, $-(CH_2)_5-$ or $-(CH_2)_2O(CH_2)_2-$;
R_6 is C_1–C_4 alkyl;
R_7 and R_8 are independently C_1–C_4 alkyl;
R_9 is C_1–C_4 alkyl, phenyl or phenyl substituted with 1–3 atoms of F, Cl or 1 Br;
R_{10} and R_{11} are independently H, C_1–C_4 alkyl, phenyl or phenyl substituted with 1 atom of Br or 1–3 atoms of F or Cl;
R_{12} is C_1–C_4 alkyl, C_1–C_4 alkoxy or NHR_9;
R_{13} and R_{14} are independently H, C_1–C_3 alkyl, OR_6, SR_6, $NHC(O)R_6$, F, Cl, Br or CO_2R_6;
R_{15} is C_1–C_4 alkyl, C_3–C_4 alkenyl, CH_2CH_2Cl or $CH_2CH_2OCH_3$;
R_{16} and R_{17} are independently C_1–C_2 alkyl;
W is O or S;
W_1 and W_2 are independently O, S or NH;
A is



X is CH_3, OCH_3, OCH_2CH_3, CH_2F, OCH_2CH_2F, OCH_2CHF_2, OCH_2CF_3 or CF_3;
Y is H, C_1–C_3 alkyl, OCH_3, OC_2H_5, CH_2OCH_3, $NHCH_3$, $N(OCH_3)CH_3$, $N(CH_3)_2$, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $CH_2OCH_2CH_3$, $OCH_2CH_2OCH_3$, CH_2SCH_3,



SCF_2H or cyclopropyl;
m is 2 or 3;
L_1 and L_2 are independently O or S;
R_{18} is H or CH_3;
provided that when Q is Q-11 or Q-12, then R_{13} is other than H.

9. A method for the control of undesirable vegetation comprising applying to the locus of such vegetation an herbicidally effective amount of a compound of claim 1.

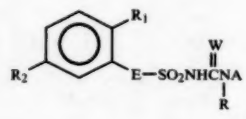
4,678,498

HERBICIDAL SULFONAMIDES

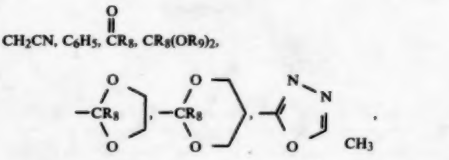
Steven P. Artz, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 743,955, Jun. 12, 1985, abandoned. This application May 12, 1986, Ser. No. 860,229
Int. Cl.[4] A01N *43/54;* **C07D** *239/69, 401/12, 413/12*
U.S. Cl. 71—87 **24 Claims**

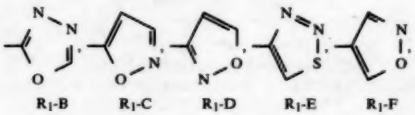
1. A compound of the formula:



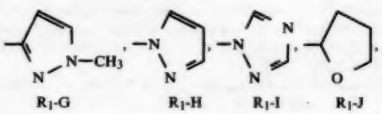
wherein
E is CH_2 or a single bond;
W is O or S;
R is H or CH_3;
R_1 is F, Cl, Br, NO_2, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 haloalkenyl, C_2–C_4 alkynyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, $OCH_2CH_2OCH_3$, C_1–C_4 haloalkoxy, C_3–C_4 alkenyloxy, C_2–C_4 haloalkenyloxy, C_3–C_4 alkynyloxy, CO_2R_3, $CONR_4R_5$, $SO_2NR_4R_5$, $SO_2N(OCH_3)CH_3$, $S(O)_nR_6$, OSO_2R_7, C_1–C_2 alkyl substituted with C_1–C_2 alkoxy, OH or C_1–C_2 alkylthio,



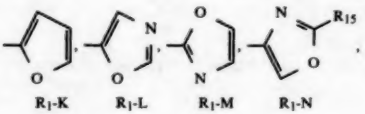
R_1-A



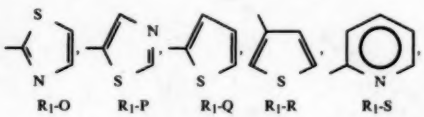
R_1-B R_1-C R_1-D R_1-E R_1-F



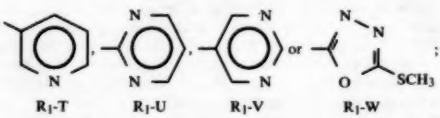
R_1-G R_1-H R_1-I R_1-J



R_1-K R_1-L R_1-M R_1-N

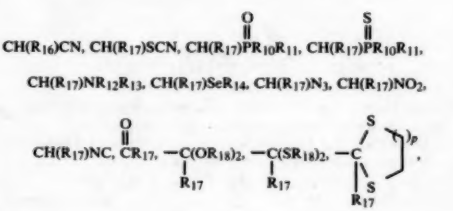


R_1-O R_1-P R_1-Q R_1-R R_1-S



R_1-T R_1-U R_1-V R_1-W

R_2 is



$CH(R_{16})CN$, $CH(R_{17})SCN$, $CH(R_{17})PR_{10}R_{11}$, $CH(R_{17})PR_{10}R_{11}$, $CH(R_{17})NR_{12}R_{13}$, $CH(R_{17})SeR_{14}$, $CH(R_{17})N_3$, $CH(R_{17})NO_2$,

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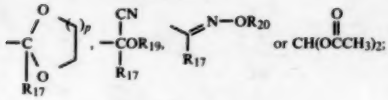
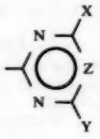


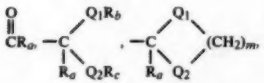
R_3 is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl,

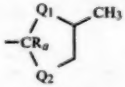
CH_2CH_2Cl, CH_2CH_2F, or C_1–C_2 alkyl substituted with OCH_3 or SCH_3;
R_4 is C_1–C_3 alkyl;
R_5 is H or C_1–C_3 alkyl;
R_4 and R_5 may be taken together to form $(CH_2)_3$ or $(CH_2)_4$;
R_6 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$ or $CH_2C{\equiv}CH$;
R_7 is C_1–C_3 alkyl or $N(CH_3)_2$;
R_8 is H, C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, CH_2CH_2Cl, CH_2CH_2F, C_1–C_2 alkyl substituted with OCH_3 or SCH_3 and C_3–C_6 cycloalkyl;
R_9 is C_1–C_2 alkyl;
R_{10} and R_{11} are independently C_1–C_2 alkyl, C_1–C_2 alkoxy, C_1–C_2 alkylthio, $NHCH_3$ or $N(CH_3)_2$;
R_{12} and R_{13} are independently H or C_1–C_2 alkyl;
R_{14} is C_1–C_3 alkyl;
R_{15} is H or CH_3;
R_{16} is H, C_1–C_2 alkyl or F;
R_{17} is H or C_1–C_2 alkyl;
R_{18} is C_1–C_2 alkyl;
R_{19} is H, $Si(CH_3)_3$ or C_1–C_2 alkyl;
R_{20} is H or C_1–C_2 alkyl;
p is 1 or 2;
n is 0, 1, or 2;
A is



A-1

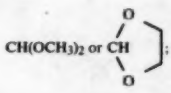
X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl, C_1–C_4 haloalkyl, C_2–C_4 alkynyl, C_3–C_5 cycloalkyl, azido, cyano,





or $N(OCH_3)CH_3$;

m is 2 or 3;
Q_1 and Q_2 are independently O or S;
R_a is H or C_1–C_3 alkyl;
R_b and R_c are independently C_1–C_3 alkyl;
Z is CH, CCH_3, CC_2H_5, CCl or CBr;
and their agriculturally suitable salts; provided that
(1) when X is halogen, then Z is CH and Y is OCH_3, OC_2H_5, NH_2, $NHCH_3$, $N(CH_3)_2$, OCF_2H or $N(OCH_3)CH_3$;
(2) when X or Y is C_1 haloalkoxy, then Z is CH;
(3) when W is S, then R is H, Z is CH and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$,



(4) when the total number of carbon atoms of X and Y is greater than four, then the combined number of carbons of R_1 and R_2 is less than or equal to six;
(5) when R_2 is $C(O)R_{17}$, then R_1 is other than C_1–C_4 haloalkyl or C_2 alkyl substituted with C_1–C_2 alkoxy or C_1–C_2 alkylthio, and Y is other than cyclopropyl;
(6) when Y is C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl or C_2–C_5 alkylsulfonylalkyl, then R_2 is other than $CH(R_{17})NO_2$.

17. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **1**.

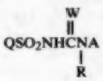
4,678,499

HERBICIDAL SULFONAMIDES

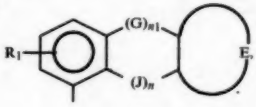
Robert J. Pasteris, and Ramaurthi Muthukrishnan, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 710,458, Mar. 11, 1985, abandoned. This application Jan. 30, 1986, Ser. No. 822,643
Int. Cl.[4] **C07D** *239/69, 239/42, 239/30, 239/48, 401/12, 405/12, 403/12;* **A01N** *43/54*
U.S. Cl. 71—90 **28 Claims**

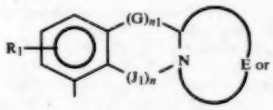
1. A compound of the formula:



wherein
W is O or S;
Q is

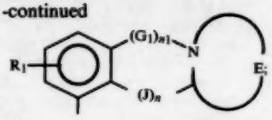


Q_1



Q_2

-continued



Q3

G is CH_2, CH_2CH_2, O, S, NH, NCH_3 or CH=CH;

G_1 is CH_2, CH_2CH_2 or CH=CH;

J is CH_2, C=O, $S(O)_m$, O, NH, NCH_3, CHOH, $CHOCH_3$, $CH(CH_3)$ or $C(CH_3)OH$;

J_1 is CH_2, C=O or SO_2;

n and n_1 are independently 0 or 1;

m is 0, 1 or 2;

E is a bridge of 3 or 4 atoms containing 0 to 2 heteroatoms selected from the group consisting of oxygen, sulfur or nitrogen, wherein 1 atom of sulfur may take the form of SO or SO_2, said bridge also containing 1 to 4 atoms of carbon wherein 1 atom of carbon may take the form of C=O, said bridge together with two attachment sites forming a non-aromatic heterocyclic or carbocyclic ring optionally substituted by 1 to 3 substituent groups selected from the group L, or E is a bridge of 3 or 4 atoms containing 1–1 heteroatoms of oxygen or sulfur and 0–3 heteroatoms of nitrogen, said bridge also containing 0–4 atoms of carbon, said bridge together with two attachment sites forming an aromatic heterocyclic or carbocyclic ring optionally substituted by 1 to 3 substituents selected from the group L, with the proviso that when E contains two oxygen atoms or two sulfur atoms said atom must be separated by at least one atom of carbon and that oxygen and sulfur are only linked to each other if the sulfur is in the form of SO or SO_2;

L is C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_2–C_8 alkoxyalkoxy, halogen, $N(CH_3)_2$, cyano, nitro, phenyl or phenyl substituted with C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, NO_2, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl or C_1–C_3 alkylsulfonyl;

R is H or CH_3;

R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro, C_1–C_3 alkoxy, $SO_2NR^IR^{II}$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CO_2R^{III} or NR_aR_b;

R^I is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;

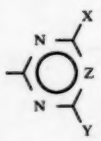
R^{II} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

R^I and R^{II} may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;

R^{III} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_1–C_3 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

R_a and R_b are independently H or C_1–C_2 alkyl;

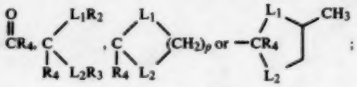
A is



A-1

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;

Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, $N(OCH_3)CH_3$,



p is 2 or 3;

L_1 and L_2 are independently O or S;

R_2 and R_3 are independently C_1–C_2 alkyl;

R_4 is H or CH_3;

Z is CH;

and their agriculturally suitable salts; provided that

(a) when X is Cl, F, Br or I, then Y is OCH_3, OC_2H_5, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;

(b) n and n_1 cannot simultaneously be O;

(c) when G or G_1 is CH_2 CH_2 or CH=CH, then n is 0;

(d) when Q is Q_1 and n is 1, then E must contain at least one heteroatom selected from oxygen, sulfur or nitrogen; and

(e) when W is S, then R is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH=CH_2$, $OCH_2C\equiv CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$

21. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,678,500

HERBICIDAL 2,6-DISUBSTITUTED BENZYLSULFONAMIDES AND BENZENESULFAMATES

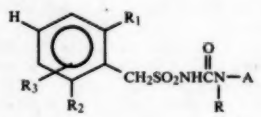
James V. Hay, Newark, and George Levitt, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 624,843, Jun. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 559,372, Dec. 8, 1983, abandoned. This application Aug. 21, 1985, Ser. No. 768,109

Int. Cl.[4] A01N *47/36*; **C07D** *239/47*

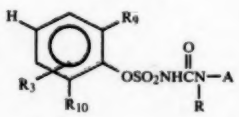
U.S. Cl. 71—92 **21 Claims**

1. A compound of the formula:



I

or



II

wherein

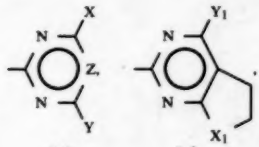
R is H or CH_3;

R_1 is CO_2R_4, $SO_2NR_5R_6$, $SO_2N(OCH_3)CH_3$, SR_7, SO_2R_7, NO_2, OCF_2H, OSO_2R_8 or $C(O)NR_{11}R_{12}$;

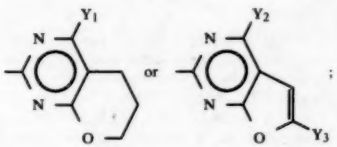
R_2 is H, CO_2R_4, $SO_2NR_5R_6$, $SO_2N(OCH_3)CH_3$, SR_7, SO_2R_7, NO_2, OCF_2H or OSO_2R_8;

R_3 is H, CH_3, OCH_3, Cl or F;

R_4 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, CH_2CH_2Cl or $CH_2CH_2OCH_3$;
R_5 and R_6 are independently C_1–C_2 alkyl;
R_7 is C_1–C_3 alkyl, CF_2H or CF_3;
R_8 is C_1–C_3 alkyl, CF_3 or $N(CH_3)_2$;
R_9 is CO_2R_4, $SO_2NR_5R_6$, $SO_2N(OCH_3)CH_3$, SR_7, SO_2R_7, OCF_2H or OSO_2R_8;
R_{10} is CO_2R_4, $SO_2NR_5R_6$, $SO_2N(OCH_3)CH_3$, SR_7, SO_2R_7, OCF_2H or OSO_2R_8;
R_{11} is H, C_1–C_2 alkyl or $CH_2CH{=}CH_2$;
R_{12} is H or C_1–C_2 alkyl; or
R_{11} and R_{12} may be taken together to form $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2$;
A is



A-1 A-2



A-3 A-4

X is CH_3, OCH_3, OCF_2H, F, Cl or Br;
Y is CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, OCF_2H, CH_2OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$, SCH_3 or OCH_2CF_3;
Z is CH;
X_1 is CH_2 or O;
Y_1 is CH_3, OCH_3 or OCH_2CH_3; and
Y_2 is CH_3, CH_2CH_3, OCH_3 or OCH_2CH_3; and
Y_3 is H or CH_3;
and their agriculturally suitable salts; provided that
(a) when X is F, Cl or Br, then Y is OCH_3, OCH_2CH_3, NH_2, $NHCH_3$ or $N(CH_3)_2$;
(b) when R_9 is CO_2R_4 or SR_7 and A is A-1 then R_{10} is other than CO_2R_4 or SR_7; and
(c) when R_2 is H, R_1 must be $C(O)NR_{11}R_{12}$.

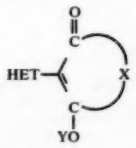
4,678,501

CERTAIN PYRAZINYL 1,3 CYCLOALKANEDIONE DERIVATIVES HAVING HERBICIDAL ACTIVITY

David T. Manning, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

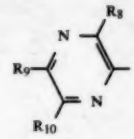
Continuation of Ser. No. 288,335, Jul. 30, 1981, abandoned. This application Jan. 9, 1986, Ser. No. 817,177
Int. Cl.⁴ A01N *43/60*; C07D *241/00*
U.S. Cl. 71—92 **10 Claims**

1. A compound of the formula:



wherein
X is a 2 or 3 member alkylene chain;
Y is hydrogen, a salt forming cation, selected from Na^+, NH_4^+ and Ca^{++}, or

wherein Z is alkyl containing up to 7 carbon atoms; and
HET is



wherein
R_8, R_9, and R_{10} are independently hydrogen, C_1–C_3 alkyl, or C_1–C_3 alkoxy.

10. A method of controlling undesired plant growth which comprises subjecting said plant to a herbicidally effective amount of the compound of claim 1.

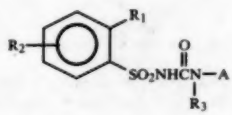
4,678,502

HERBICIDAL ORTHO-ALKYL- AND ORTHO-ALKENYL-SUBSTITUTED BENZENESULFONAMIDES

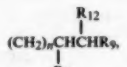
Mary A. Hanagan, Blue Bell, Pa., and Mark E. Thompson, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 516,078, Jul. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 416,563, Sep. 10, 1982, abandoned. This application May 3, 1985, Ser. No. 730,157
Int. Cl.⁴ A01N *43/66, 43/70*; C07D *251/52, 251/16*
U.S. Cl. 71—93 **24 Claims**

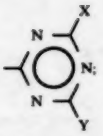
1. A compound of the formula:



wherein
R_1 is $(CH_2)_nCH_2CHR_4R_5$,



$CH{=}CHR_9$, $CH{=}CHCO_2CH_3$ or $CH{=}CF_2$;
R_2 is H, F, Cl, CH_3, OCH_3 or CF_3;
R_3 is H or CH_3;
R_4 is H, F, Cl, Br or CH_3;
R_5 is F, Br, $OCH_2\phi$, OSO_2R_6, OSO_2CF_3, $OSO_2C_6H_5R_7$, $S(O)_mR_6$ or $OSO_2N(CH_3)_2$
R_6 is C_1–C_3 alkyl;
R_7 is H, F, Cl, Br, CH_3, OCH_3 or CF_3;
R_9 is OCH_3 or OCH_2CH_3;
R_{10} is H, OCH_3 or OCH_2CH_3;
R_{12} is H or CH_3;
n is 0 or 1;
m is 0, 1 or 2;
A is



A-1

X is CH_3, OCH_3, CH_2CH_3, OCH_2CH_3 or OCF_2H;

Y is H, NH_2, $NHCH_3$, $N(CH_3)_2$, C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1–3 atoms of (a) F, (b) Cl or (c) Br, CH_2OCH_3, $CH_2OCH_2CH_3$, C_1–C_4 alkoxy, C_1–C_2 alkylthio, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$, $CH(OCH_2CH_3)_2$,

OCH_2CF_3, OCH_2CH_2F, OCH_2CH_2Cl, OCH_2CH_2Br or GCF_2T; wherein G is O or S and T is H, CHClF, CHBrF, CF_2H or $CHFCF_3$;

Z is N;

and their agriculturally suitable salts; provided that

(a) when R_4 is halogen, R_5 is the same halogen;

(b) when R_5 is halogen, R_4 is either hydrogen or the same halogen; and

(c) when R_{12} is CH_3 and R_{10} is alkoxy, R_9 is the same alkoxy.

9. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid or liquid inert diluent.

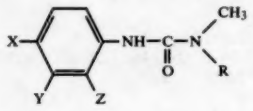
4,678,503

CONCENTRATED AQUEOUS SUSPENSIONS BASED ON NEBURON

Denis Barlet, Lyons, and Dini Alain, Villefranches, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Aug. 12, 1982, Ser. No. 407,464
Int. Cl.[4] H01D *25/22*
U.S. Cl. 71—93 **14 Claims**

1. A herbicidal composition based on neburon, in the form of a concentrated aqueous suspension containing neburon and, optionally, thickening, wetting and/or dispersing adjuvants, which composition alo contains a nonphytotoxic amount of from 1 to 10% by weight, relative to neburon, of a stabiliser of the formula:



(I)

in which:

X, Y and Z are identical or different and each represents a hydrogen atom, a halogen atom or an optionally halogenated alkyl radical containing from 1 to 4 carbon atoms and R represents an alkyl radical containing from 1 to 3 carbon atoms.

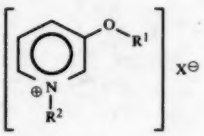
4,678,504

O-SUBSTITUTED 3-OXYPRIDINIUM SALTS, THEIR PREPARATION AND THEIR USE AS FUNGICIDES FOR CROP PROTECTION

Guenter Schulz; Eberhard Ammermann, both of Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

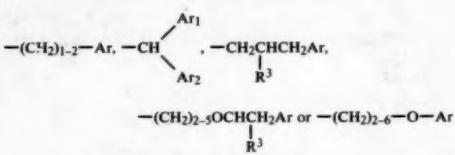
Filed Jun. 25, 1986, Ser. No. 878,218
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3522905
Int. Cl.[4] A01N *43/40*; C07D *213/02*
U.S. Cl. 71—94 **4 Claims**

1. An O-substituted 3-oxypyridinium salt of the formula

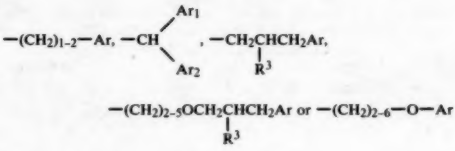


I

where R^1 is an alkyl, alkenyl or alkynyl radical which contains a total of 8 to 20 carbon atoms and is unsubstituted or substituted by halogen, or is —C_2—C_{10}-alkyl—O—C_5—C_{18}-alkyl which contains a total of 10 to 20 carbon atoms and may contain 1 or 2 double bonds or one triple bond which are or is separated from O by one or more CH_2 groups, or R^1 is



where Ar, Ar_1 are each 1- or 2-naphthyl, biphenyl or phenyl, and the phenyl radical may be substituted by F, Cl, Br, NO_2, CF_3, CN, C_1–C_{13}—alkyl, C_2–C_4—alkenyl or C_1— or C_2—alkoxy and R^3 is H, C_1— or C_2—alkyl, C_3–C_5—alkenyl or C_1–C_5—alkoxy, R^2 is an alkyl, alkenyl or alkynyl radical of 1 to 2 or 3 to 8 carbon atoms which is unsubstituted or substituted by C_1–C_4—alkoxy or halogen, or R^2 is



where Ar, Ar_1 are each 1- or 2-naphthyl, biphenyl or phenyl, and the phenyl radical may be substituted by F, Cl, Br, NO_2, CF_3, CN, C_1–C_3—alkyl, C_2–C_4—alkenyl or C_1— or C_2—alkoxy, and X^- is F^-, Cl^-, Br^- or I^- or one equivalent of an anion of a non-phytotoxic acid.

3. A fungicidal composition for crop protection, containing a solid or liquid carrier and a fungicidally effective amount of an o-substituted 3-oxypyridinium salt as set forth in claim **1**.

4,678,505

PROCESS FOR FORMING SOLID SOLUTIONS

William R. Bushey, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 802,029, Nov. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 645,425, Aug. 29, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 931,958

Int. Cl.[4] C22B 5/00

U.S. Cl. 75—0.5 A 12 Claims

1. A process for forming a solid solution of two or more metals or metal oxides by ionic reaction and simultaneous precipitation from the reaction medium comprising the steps of:

a. in a high intensity mixing apparatus, forming a microdispersion of (1) an aqueous liquid solution of the metal ions and (2) at least a stoichiometric amount relative to the dissolved metal ions of a fluid co-reactant which is soluble in the aqueous solvent for the metals to effect liquid phase reactions between the dissolved metal ions and the fluid co-reactant, the rates of which reactions are pH sensitive, and formation in the liquid phase of the metals, the rate of forming the microdispersion being faster than the ionic reactions:

b. simultaneously adjusting the pH of the microdispersion as necessary to maintain the reaction between the metal ions and the coreactant at a rate faster than the rate of precipitation of metals from the reaction medium;

c. maintaining the microdispersion for a time sufficient to effect simultaneous precipitation of the formed metals or metal oxides and formation of finely divided particles of a single solid solution of the metals having the proportions of the initial metal reactants and dispersion in the reaction medium of the finely divided solid solution particles;

d. removing reaction medium containing the dispersed solid solution particles from the mixing apparatus; and

e. separating the particles of solid solution of the metals or metal oxides from the removed reaction medium.

4,678,506

PRODUCTION OF TITANIUM ARTICLES THAT ARE FREE FROM LOW DENSITY INCLUSIONS

Paul J. Bania, Boulder City, Nev., assignor to Titanium Metals Corporation of America (TIMET), Pittsburgh, Pa.

Filed Aug. 11, 1986, Ser. No. 895,446

Int. Cl.[4] C22B 4/00

U.S. Cl. 75—10.25 4 Claims

1. A method for producing arc melted titanium articles substantially free of low-density inclusions, said method comprising producing a partial charge of titanium sponge of a maximum particle size of −6 mesh and finer, forming said particles into an electrode and arc melting said electrode to form an ingot.

4,678,507

TREATMENT OF DROSS

Richard G. Hollis, Mount Isa, Australia, assignor to Mount Isa Mines Limited and Commonwealth Scientific & Industrial Organization, both of, Australia

PCT No. PCT/AU84/00235, § 371 Date Jun. 18, 1985, § 102(e) Date Jun. 18, 1985, PCT Pub. No. WO85/02204, PCT Pub. Date May 23, 1985

PCT Filed Nov. 16, 1984, Ser. No. 767,272

Claims priority, application Australia, Nov. 18, 1983, PG2452

Int. Cl.[4] C22B 13/00, 15/00

U.S. Cl. 75—24 7 Claims

1. A pyrometallurgical method for separating lead constituents including lead and lead sulfide from copper constituents including copper sulfide of a dross essentially free of alkali metal additives, the process comprising in sequence:

melting the dross at a temperature in excess of 900° C.;

waiting for the molten dross to separate into a layer of lead bullion and a layer of matte, said matte containing copper and lead predominantly in the form of lead sulfide;

removing the lead bullion layer;

heating the matte layer after removal of the lead bullion layer to a temperature in excess of 1000° C. by means of a combustion lance submerged in said matte causing at least a major portion of said lead sulfide to leave said matte in the form of lead sulfide fume thereby producing a copper matte sufficiently low in lead assay to be sent to a copper recovery operation without further treatment; and

recovering said lead sulfite as lead fume.

4,678,508

METHOD FOR FLUIDIZED BED REDUCTION OF IRON ORE

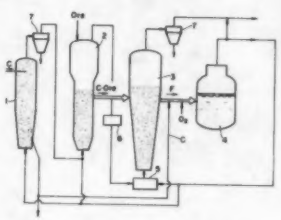
Osamu Saeki; Kenji Mori, both of Kobe; Mamoru Onoda, Hyogo; Ryo Watanabe, Kobe; Katsufumi Shinohara, Kobe; Takehiko Ashie, Kobe, and Nobuyuki Imanishi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 12, 1985, Ser. No. 775,394

Claims priority, application Japan, Sep. 12, 1984, 59-191330

Int. Cl.[4] C21B 13/02

U.S. Cl. 75—26 12 Claims



1. A method of reducing iron ore in a fluidized bed, comprising the steps of:

(a) pyrolyzing coal in a first fluidized bed reactor thereby producing char and a gaseous product which contains tar;

(b) thermally cracking said gaseous product in a second fluidized bed reactor which contains powdered iron ore, thereby depositing a carbonaceous material on the surface of the iron ore powder and producing a gas; and

(c) reducing said coated iron ore powder in a third bed which is fluidized by a gas mixture composed of a gas generated in a gas generating apparatus and said gas produced in the second, thermal cracking step.

4,678,509

CERTAIN PYRIDYLOXY OR THRIO-PHENOXY-PROPANOIC ACIDS OR SALTS THEREOF USEFUL AS HERBICIDES

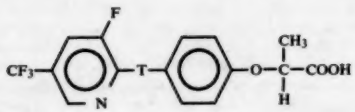
Howard Johnston, Walnut Creek, and Lillian H. Troxell, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 497,295, May 23, 1983, Pat. No. 4,565,568, which is a continuation-in-part of Ser. No. 389,840, Jun. 18, 1982, abandoned. This application Nov. 1, 1985, Ser. No. 793,865

Int. Cl.[4] A01N 43/40; C07D 213/64

U.S. Cl. 71—94 2 Claims

1. A method of killing and/or controlling the growth of undesired grassy plants which comprises providing in said plants a herbicidally effective amount of a compound having the formula



wherein T is O or S, in the acid or alkali or alkaline earth metal salt or ammonium or organic amine salt form.

4,678,510

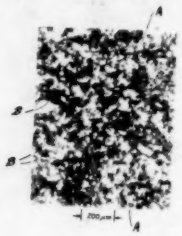
WEAR RESISTANT IRON POWDER ARTICLE

William F. Jandeska, Jr., Rochester, and Vadim Rezhets, Southfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 813,055, Dec. 24, 1985, abandoned. This application Sep. 30, 1986, Ser. No. 913,488

Int. Cl.[4] C22C *29/14*

U.S. Cl. 75—244 **7 Claims**



1. A powder metallurgical method for forming a wear resistant iron alloy article comprising compacting and sintering a powder mixture comprising, by weight of product metal, between about 1 and 2 percent carbon powder, optionally up to about 4 percent copper powder, a powdered boron source and the balance substantially low-carbon iron powder, said boron source comprising a metal boride containing a metal selected from the group consisting of nickel, cobalt and manganese and suitable for producing a transient liquid phase during sintering, said sintering being carried out at a temperature and for a time sufficient to bond said iron into an integral structure and to diffuse carbon and boron into said structure to produce a microstructure characterized by borocementite particles dispersed in an iron matrix formed predominantly of martensite or pearlite, said particles having a cross-sectional dimension greater than 1 micron and being present in an amount at least 4 volume percent to improve wear resistance.

4,678,511

SPRAY MICROPELLETS

Junichi Yasuoka; Sumio Kamiyama; Kiyomi Ashida, and Ryozo Hata, all of Uji, Japan, assignors to Awamura Metal Industry Co., Ltd., Kyoto, Japan

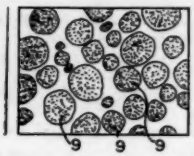
Filed Sep. 5, 1985, Ser. No. 772,942

Claims priority, application Japan, Sep. 8, 1984, 59-188582

Int. Cl.[4] B22F *1/02*

U.S. Cl. 75—251 **17 Claims**

1. Spray micropellets having a particle size of 5 to 150 μm consisting essentially of micropelletized fine powder of high carbon ferrochrome alloy having a particle size of 0.5 to 20 μm, said alloy consisting essentially of 20 to 80 wt. % Cr, 15 to



75 wt. % Fe, 5 to 10 wt. % C, less than 10 wt. % Si and Ti and Mn as unavoidable impurities.

4,678,512

MARINE COATING COMPOSITIONS AND METHOD

Ralph R. Grams, 2025 N.W. 24th St., Gainesville, Fla. 32605

Continuation-in-part of Ser. No. 543,499, Sep. 21, 1983, Pat. No. 4,552,813, which is a continuation-in-part of Ser. No. 348,504, Feb. 12, 1982, abandoned. This application Oct. 15, 1985, Ser. No. 787,818

Int. Cl.[4] C09D *5/16*

U.S. Cl. 106—18.32 **12 Claims**

1. An antifouling coating material for use on surfaces or objects subjected to seawater or fresh water, said coating material comprising a marine paint including a vehicle, a solvent and a pigment, said marine paint also having dispersed therein at least about 250 mg of polycyclic naphthacene carboxamide particles per quart of coating material.

4,678,513

POLYOL COMPOSITIONS CONTAINING MOULD RELEASE AGENT

Giancarlo Bagaglio, Brussels; Jan V. Assche, Steenhuffel, and Arun Watts, Brussels, all of Belgium, assignors to Imperial Chemical Industries plc, London, United Kingdom

Continuation of Ser. No. 707,839, Mar. 4, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 902,030

Claims priority, application United Kingdom, Mar. 14, 1984, 8406677

Int. Cl.[4] B28B *7/36*

U.S. Cl. 106—38.22 **4 Claims**

1. A stable polyol composition for use in reaction injection moulding (RIM) processing of polyurethanes, said composition consisting essentially on a weight basis of:

(a) 100 parts of a polymeric polyol selected from polyoxypropylene diols and triols and poly(oxypropyleneoxyethylene) diols and triols having hydroxyl equivalent weights of from 750 to 3000 and mixtures thereof;

(b) 1 to 10 parts of a polysiloxane mould release agent which consists essentially of 0.5–20 mol % of $R_aR'_bSiO[4-(a+b)]/2$ units and from 99.5–80 mol % of $R''_cSiO(4-c)/2$ units

where

R is an isocyanate reactive organic radical,

a has an average value of from 1–3,

R′ and R″ are hydrocarbon radical or a substituted organic radical,

b has an average value of 0–2,

a+b is from 1–3,

c has an average value from 1 to 3, whereas

(i) the ratio of the total molecular weight to the total number of isocyanate reactive functional groups in the polysiloxane molecule ranges from 100–3500,

(ii) the combined formula weights of all isocyanate reactive organic radicals R do not exceed 40% of the total molecular weight of the polysiloxane mould release agent,

(iii) the combined formula weights of all non-isocyanate reactive radicals R′ and R″ together do not exceed

40% of the total molecular weight of the polysiloxane mould release agent;

(c) 1 to 5 parts of an ethylene oxide based surfactant having the formula

$$QO(CH_2CH_2O)_nH$$

wherein Q represents an alkyl, alkylphenyl or alkanoyl residue containing from 8 to 30 carbon atoms and n has an average value of from 20 to 150.

4,678,514
PROCESS FOR THE DISPOSAL OF COMBUSTIBLE REFUSES

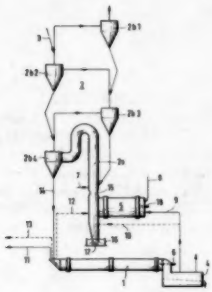
Henning Deyhle, Schlangenbad, and Alexaner Grisar, Mainz-Finthen, both of Fed. Rep. of Germany, assignors to Dyckerhoff Engineering GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,437

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411144; Mar. 27, 1984, 3411148

Int. Cl.⁴ C04B *7/43*

U.S. Cl. 106—100 **17 Claims**



1. In the disposal of combustible refuse and the manufacture of cement clinker from cement raw meal by a process comprising the steps of

(a) preheating and calcining the cement raw material in a preheater,

(b) feeding the preheated calcined cement raw material produced in (a) into a cement rotary kiln,

(c) burning the calcined raw material in the rotary kiln to form clinker, and subsequently air cooling said clinker in a clinker cooler, thereby producing hot exhaust air, and

(d) incinerating the combustible refuse in an incinerator generating flue gas and slag, and transferring heat from the flue gas to the cement raw material,

the improvement which comprises

(i) feeding hot exhaust air from (c) to the incinerator in (d),

(ii) conducting the incineration in (d) to produce flue gas of 1000°–1400° C. and feeding it to (a), and

(iii) separating the slag produced in (d).

4,678,515
FOAM GENERATING COMPOSITIONS

Harold A. Green, Havertown, Pa., and Morris Weinstein, Paramus, N.J., assignors to Stepan Company, Northfield, Ill.

Division of Ser. No. 771,628, Sep. 3, 1985, Pat. No. 4,618,370. This application Jul. 14, 1986, Ser. No. 885,297

Int. Cl.⁴ C04B *24/00;* **B32B** *5/20;* **B01V** *13/00;* **B29C** *27/60*

U.S. Cl. 106—111 **2 Claims**

1. In the method of making gypsum board wherein an aqueous slurry of calcined gypsum is spread between a pair of impervious barriers where it is hardened by re-hydration, the step of entraining microscopic air bubbles in the core of said gypsum board by incorporating into said slurry, prior to hardening an effective amount to produce a foam of relatively high stability and volume of a composition comprising salt of a mixture of n-alkyl oxyethylated sulfuric acids, the salt being selected from the group consisting of sodium salt, ammonium salt and mixtures thereof, all of said salts having the formula $CH_3(CH_2)_xCH_2(OCH_2CH_2)_yOSO_3^-M^+$, M^+ being either the sodium or ammonium cation, x being an integer from about 6 to 12 and y being an integer of about 1 to 3.5, a major portion of said mixture consisting of those compounds in which x equals about 6 to 8 and a minor portion of said mixture consisting of those compounds in which x equals about 10 to 12 wherein the ratio of the combined weight of the compounds in which x equals about 6 to 8 to the combined weight of the compounds in which x equals about 10 to 12 is from about 2:1 to about 8:1, wherein the ratio of the weight of the compounds in which x equals about 6 to the weight of the compounds in which x equals about 8 is about 1:1, and wherein the ratio of the weight of the compounds in which x equals about 10 to the weight of the compounds in which x equals about 12 is from about 3:1 to about 1:3.

4,678,516
SUSTAINED RELEASE DOSAGE FORM BASED ON HIGHLY PLASTICIZED CELLULOSE ETHER GELS

Daniel A. Alderman, and Troy D. Wolford, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 9, 1984, Ser. No. 658,964

Int. Cl.⁴ A61K *31/715, 31/405*

U.S. Cl. 106—197.1 **14 Claims**

1. A thermoformable sustained release matrix for the prolonged release of an active organic material, which matrix comprises (a) a thermoplastic water-soluble gel comprising a water-soluble hydroxypropyl methylcellulose homogeneously dispersed in an amount of a plasticizer for the cellulose ether sufficient to render the matrix thermoformable, and (b) dispersed in said gel, an effective amount of an active organic material.

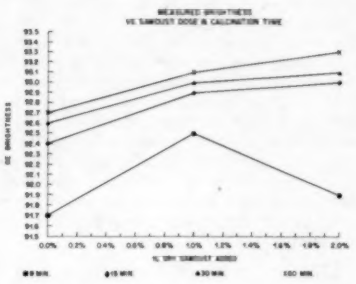
4,678,517
METHOD FOR CALCINING KAOLIN

Weyman H. Dunaway, Sandersville, Ga., assignor to E.C.C. America Inc., Atlanta, Ga.

Filed Jul. 25, 1986, Ser. No. 890,151

Int. Cl.⁴ C04B *14/00*

U.S. Cl. 106—309 **12 Claims**



1. A method for improving brightness in a calcined kaolin pigment while minimizing detrimental effects on abrasiveness; comprising: intermixing with a kaolin calciner feed a particulate material which is oxidizable during calcining to provide a source of auxiliary thermal energy in the kaolin bed; and calcining the mixture at a temperature in the range of above 900° C., but below about 1100° C., in the presence of an oxidizing atmosphere throughout the calcining step.

4,678,518
NON-AQUEOUS DEGREASING AND CHROMATING SOLUTION FOR METAL TREATMENT

Nobuhiro Ayukawa, and Yasuhiko Konishi, both of Kanagawa, Japan, assignors to Nippon Dacro Shamrock Co., Ltd., Yokohama, Japan

Filed Jul. 11, 1985, Ser. No. 753,789
Claims priority, application Japan, Jul. 25, 1984, 59-153028
Int. Cl.[4] B08B *3/08;* **C07C** *17/42;* **C11D** *7/50;* **C23G** *5/02*
U.S. Cl. 148—6.2 **2 Claims**

1. A non-aqueous degreasing and chromating solution for metal treatment essentially consisting of 100 parts by weight of a chlorofluorocarbon solvent, containing not more than 2 carbon atoms, fluorine atoms and chlorine atoms and no hydrogen atom, 0.5–5 parts by weight of chromic acid anhydride, 0.001–0.1 part by weight of an organic carboxylic acid containing 1–20 carbon atoms represented by the general formula $R(COOH)_n$ wherein R is a straight-chained, branched or cyclic hydrocarbyl group, which may be substituted and n is an integer 1–3, and 1–20 parts by weight of an alcohol solubilizer containing 3–20 carbon atoms.

4,678,519
METHOD OF ZINC PHOSPHATIZATION, ACTIVATION AND REFINING BATH USED IN SAID METHOD AND CORRESPONDING CONCENTRATE

Joseph Schapira, Paris; Victor Ken, Colombes; Denis Théry, Deuil la Barre, and Stéphane Jelodin, Argenteuil, all of France, assignors to Compagnie Francaise de Produits Industriels, Gennevilliers, France

Filed Oct. 31, 1985, Ser. No. 793,346
Claims priority, application France, Oct. 31, 1984, 84 16725
Int. Cl.[4] C23C *22/80*
U.S. Cl. 148—6.15 Z **10 Claims**

1. In a method for the phosphatization with zinc of articles of large surface constituted by a metal selected from the group consisting of iron, zinc and their alloys, the said articles which are submitted successively to

(1) at least one alkaline degreasing step,

(2) at least one rinsing step with running city water,

(3) an activating and refining step carried out by way of a bath having a pH from 7 to 9.5 and comprising in industrial water at least one Jernstedt salt in a proportion corresponding to about 1 to 100 ppm of titanium,

(4) the zinc phosphatization step proper,

(5) at least one rinsing step with water, being treated by immersion in the bath used in the activating and refining step, the improvement, which permits the use of industrial water despite of its hardness for the constitution of the said bath and without recourse to overflow necessitating the addition of Jernsted salt proportional to the amounts of water added, while enabling an effect of refining and stability comparable with that obtained in demineralized water and according to which improvement the said bath comprises a proportion of 10 to 700 ppm of at least one alkane-phosphonic acid of formula

(I)

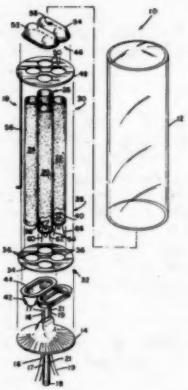
in which R_1 represents an alkyl radical or an aryl radical possibly substituted by at least one of the substituents of the group comprising the hydroxyl radical, other phosphonic groups and amino groups of formula

in which R_2 and R_3 may be identical or different from one another, each representing a hydrogen atom or having the significance of R_1, or at least one of the alkali or ammonium salts corresponding to the abovesaid alkane-phosphonic acids.

4,678,520
ELECTRICAL LEAD-INS FOR USE FOR ARC SUSTAINING ATMOSPHERES

Andre C. Bouchard, Peabody; Paul A. Thibault, Danvers, and Radomir I. Lagushenko, Brookline, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Division of Ser. No. 481,689, Apr. 4, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 698,216
Int. Cl.[4] C23C *8/14*
U.S. Cl. 148—6.35 **3 Claims**



1. The method of forming an insulating oxide coating on electrical lead-ins comprising the steps of: forming a given length of said lead-ins; and heating said given length of said lead-ins to a given temperature for a given amount of time with a gas-oxygen flame, said heating being sufficient to provide said insulating oxide coating having a contact resistance of about 10^4 ohms per centimeter of said given length of said lead-ins, said insulating oxide coating being sufficient to provide an arcing potential between said lead-ins that is greater than the normal operating potential between said lead-ins when said lead-ins are positioned in an arc sustaining atmosphere.

4,678,521
PROCESS FOR PRODUCING ZIRCONIUM-BASED ALLOY AND THE PRODUCT THEREOF

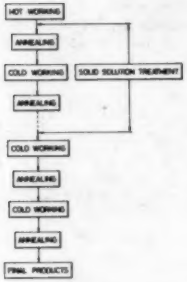
Toshimi Yoshida; Hideo Maki, both of Katsuta; Hajime Umehara, Hitachi; Tetsuo Yasuda, Hitachi; Isao Masaoka, Hitachi; Iwao Takase, Tohkai; Masahisa Inagaki, Hitachi; Ryutarou Jimbow, Hitachiohta, and Keiichi Kuniya, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 400,252, Jul. 21, 1982, abandoned. This application Mar. 3, 1986, Ser. No. 837,557

Claims priority, application Japan, Jul. 29, 1981, 56-119739; Jul. 29, 1981, 56-119740

Int. Cl.[4] C21D *8/00*; C22C *16/00*

U.S. Cl. 148—11.5 F 31 Claims



1. A process of producing a zirconium-based alloy consisting essentially of 1 to 2 wt% of Sn, 0.05 to 0.3 wt% of Fe, 0.05 to 0.2 wt% of Cr, up to 0.1 wt% of Ni and the balance being Zr, having improved corrosion resistance, including the steps of:

(a) heating the zirconium-based alloy at a temperature within a range of the single β phase and quenching the heated alloy to effect a solid solution treatment;

(b) after said solid solution treatment, hot plastic working the alloy;

(c) subjecting the hot-worked alloy to another solid solution treatment in which it is heated for a heating time of 5 minutes or less, to a temperature within a temperature range capable of forming α and β phases of the alloy, so as to transform the alloy to α and β structures, and then quenched;

(d) cold plastic working the solution-treated alloy at a temperature lower than the recrystallization temperature of the alloy, said another solid solution treatment being performed before the first cold plastic working but after the hot plastic working; and then

(e) annealing the cold-worked alloy at a temperature of 400° to 640° C.;

and wherein the cold plastic working of step (d) and annealing of step (e) are repeated at least once, whereby the alloy is subjected to the cold plastic working and the annealing at least twice subsequent to said another solid solution treatment.

4,678,522
COLD ROLLED STEEL SHEET HAVING EXCELLENT PRESS FORMABILITY AND METHOD FOR PRODUCING THE SAME

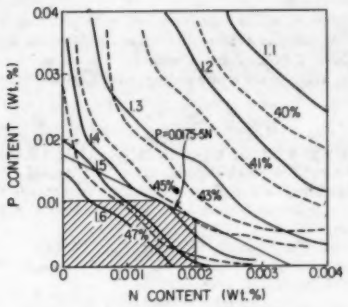
Tsuyoshi Kawano; Shiroh Sanagi, and Koe Nakajima, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 776,097, Sep. 16, 1985, Pat. No. 4,627,881, which is a continuation of Ser. No. 591,902, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 419,055, Sep. 16, 1982, abandoned. This application Aug. 7, 1986, Ser. No. 894,255

Claims priority, application Japan, Sep. 18, 1981, 56-146348; Sep. 18, 1981, 56-146349

Int. Cl.[4] C21D *7/02, 7/13*

U.S. Cl. 148—12 C 4 Claims



1. A method for producing a cold rolled boron steel sheet having press formability which comprises: hot rolling at a temperature of at least 850° C. an Al-killed boron steel consisting of, by weight, not more than 0.050% C, 0.10~0.40% Mn, 0.010~0.050% Al, not more than 0.0020% N, not more than 0.010% P, not more than 0.02% Si, and $B/N \leqq 1.5$, wherein the relation between P and N is such that $P+5N \leqq 0.0175\%$, the remainder of steel being Fe and unavoidable impurities, cold rolling the hot rolled steel at a reduction of at least 50%, and subjecting the cold rolled steel to recrystallization continuous annealing at a temperature between the recrystallization temperature and the A_3 point for not longer than five minutes.

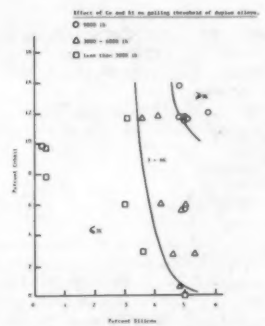
4,678,523
CORROSION- AND WEAR-RESISTANT DUPLEX STEEL

Narasi Sridhar, Carmel, and Paul Crook, Kokomo, both of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Jul. 3, 1986, Ser. No. 882,552

Int. Cl.[4] C22C *38/52*

U.S. Cl. 148—325 5 Claims



1. A stainless steel having a duplex structure consisting of about 5 to 60% ferrite and the balance essentially austenite

consisting essentially of, in weight percent, less than 0.1 carbon, 6 to 16 cobalt, 16 to 26 chromium, 7 to 20 nickel, 3 to 6 silicon, up to 4 molybdenum, up to 3 copper, less than 0.4 nitrogen, and the balance iron plus impurities, wherein the ratio of cobalt to silicon is between 1 and 4.5 to provide a desirable combination of wear and corrosion resistance to the steel.

4,678,524

CAST EXPLOSIVE COMPOSITION AND METHOD

Don H. Cranney, South Jordan; David L. Gordon, American Fork, and Richard H. Hales, West Jordan, all of Utah, assignors to IRECO Incorporated, Salt Lake City, Utah

Filed Jun. 18, 1986, Ser. No. 875,467

Int. Cl.[4] C06B *45/02*

U.S. Cl. 149—21 **36 Claims**

1. A method of formulating a cast explosive composition comprising forming a stable, fluid, water-containing, water-in-oil emulsion explosive and adding a desiccant in an amount sufficient to cause the emulsion explosive to solidify.

4,678,525

PROCESS OF MANUFACTURING SLIDE FRAMES

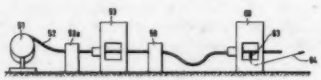
Peter Mundt, Garmisch-Partenkirchen, and Arnold Neuhold, Farchant, both of Fed. Rep. of Germany, assignors to Geimuplast Peter Mundt GmbH. & Co. KG., Farchant, Fed. Rep. of Germany

Filed Apr. 30, 1985, Ser. No. 729,119

Claims priority, application Fed. Rep. of Germany, May 7, 1984, 3416760; May 7, 1984, 3416761

Int. Cl.[4] B29C *65/08*; G09F *1/12*

U.S. Cl. 156—73.1 **21 Claims**



1. A process of manufacturing slide frames, which are adapted to be elastically expanded comprising the steps of:

providing at least one extruded plastic sheet plastic web;

forming a film bed from said plastic web, which is peripherally closed and which serves to receive a slide, by embossing;

punching said plastic web to form picture gates;

joining plastic web portions of said web by either gluing or ultrasonic welding to form a frame; and

punching said joined webs to form the external contour of the frame.

4,678,526

METHOD AND APPARATUS FOR FORMING DRAIN PIPES

Manfred Hawerkamp, Altenrather Strasse 5, 5210 Troisdorf, Fed. Rep. of Germany

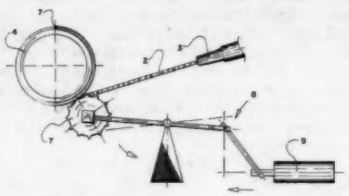
Filed Sep. 12, 1985, Ser. No. 775,486

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433931

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—195 **2 Claims**

1. A method for manufacturing drainage pipe for the dewatering and degassing of waste material, comprising extruding a plastic band of thermoplastic material, the plastic band being heated to the plastic state, winding the plastic band in a helical path on a winding spindle while the plastic band is still heated and in its plastic state, the helical path causing turns of the plastic band to overlap in a winding seam, the turns of plastic band becoming welded together at the winding seam, and perforating the plastic band with perforations which extend entirely through the plastic band while the plastic band is still



in its plastic state and after the plastic band has been wound onto the winding spindle.

4,678,527

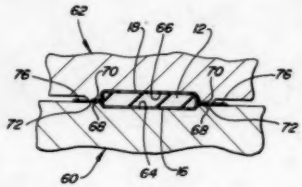
METHOD FOR MAKING NONPLANAR ABSORBENT PRODUCTS

John Ulman, Woodbridge, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Sep. 17, 1984, Ser. No. 651,125

Int. Cl.[4] B32B *31/08*

U.S. Cl. 156—213 **11 Claims**



1. A process for producing an arcuate shaped napkin having a concave body facing side and a convex garment facing side comprising:

delivery onto an arcuate shaped surface, a composite comprising a layer of absorbent core, said layer of absorbent core having a body facing side and a garment facing side; said composite further comprising a first layer of body facing side cover overlying said body facing side of said absorbent core and a second layer of garment facing side cover overlying said garment facing side of said absorbent core;

said cover layers extending beyond the periphery of said absorbent core and being in face-to-face relationship to each other beyond said periphery and being unsealed to each other so as to be free to move relative to each other while still maintaining their face-to-face relationship;

deforming said composite to conform to the arcuate shape of the arcuate shaped surface; and

sealing said cover layers to each other about the periphery of said absorbent core while said composite is on said arcuate shaped surface.

4,678,528

METHOD AND APPARATUS FOR MAKING A PRINTED AND EMBOSSED FLOOR COVERING USING A CAST WEAR LAYER

Merrill M. Smith, Morrisville, Pa., and Donald C. Ferguson, Trenton, N.J., assignors to American Biltrite, Inc., Wellesley Hills, Mass.

Filed Mar. 5, 1985, Ser. No. 708,306

Int. Cl.[4] B32B *31/18, 31/22, 31/28*; B44C *1/24*

U.S. Cl. 156—220 **20 Claims**

1. A method of making, on a continuous basis, a composite tile having the sharp and vivid coloring characteristics of

ceramic tiles by transferring a printed cast wear layer onto a base web comprising the steps of:

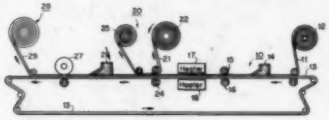
forming a continuous printed cast wear layer on a release paper comprising the steps of:

applying a continuous layer of clear liquid plastisol to a continuous moving sheet of release paper;

forming a smooth surface on said clear liquid plastisol layer;

gelling said clear liquid plastisol layer;

transferring a printed design from a preprinted stable carrier sheet to the smooth surface of said clear plastisol layer, said printed design being formed by a material compatible with said clear plastisol layer, said printed



design including a first portion which constitutes a decorative design for said composite tile; and

applying an opaque liquid plastisol backing layer to the printed surface of the clear plastisol layer;

gelling said opaque liquid plastisol layer; forming a continuous base web on a supported surface traveling in a horizontal direction, said supported surface being made of a material such that the base web will adhere to the surface when the web is hot but can be removed from it when the web is cooled;

transferring the continuous printed cast layer from the continuous sheet of release paper to the base web; and

laminating the printed cast wear layer to the base

4,678,529

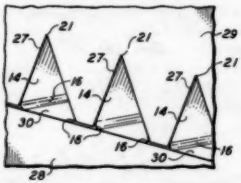
SELECTIVE APPLICATION OF ADHESIVE AND BONDING PROCESS FOR INK JET PRINTHEADS

Donald J. Drake, Rochester; Michael R. Campanelli, and Dale R. Ims, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1986, Ser. No. 881,414

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—234 **10 Claims**



1. A method of bonding mating surfaces of at least two components together, wherein at least one of the surfaces to be bonded contains recesses therein and wherein said recesses require minimum entrant into or minimum volume reduction by the adhesive after completion of the bonding of the components, the bonding method comprising the steps of:

(a) applying a relatively thin layer of an adhesive to a flexible substrate, the adhesive being of the type capable of having a state wherein its viscosity is lowered to a point that its molecule-to-molecule adhering forces are weaker than its molecule-to-interface bonding forces upon the application of a predetermined temperature within a predetermined time period after the adhesive layer is applied to the flexible substrate;

(b) placing the adhesive layer that is on said flexible substrate on the surface of the component having the recesses and heating the adhesive layer so that it enters said state of low viscosity within said predetermined time period, the adhesive layer contacting only the higher surface portions of the component having the recesses and not contacting any of the recess surfaces;

(c) peeling the flexible substrate away from the surface of the component having the recesses at an angle thereto such that high stress is placed on the adhesive layer at the peeled edge of the flexible substrate, the peeling being done within said predetermined time period and while the adhesive is in said low viscosity state, so that the adhesive layer fails cohesively leaving about half of the adhesive layer on the flexible substrate and the remainder of the adhesive layer coating the higher surface portions of the component having the recesses;

(d) aligning and mating the surface of the component having the adhesive coating on its higher surface portions with a surface of the other component; and

(e) curing the adhesive to bond the mated components together.

4,678,530

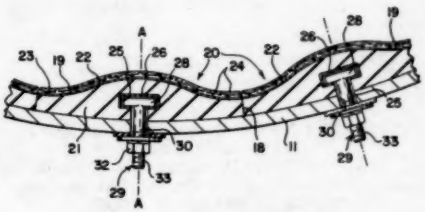
METHOD OF MAKING LINER SECTIONS FOR ROTARY PULVERIZERS

Richard E. Eroskey, Munroe Falls, and Larry G. Miller, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 627,245, Jul. 2, 1984, Pat. No. 4,580,734. This application Nov. 6, 1985, Ser. No. 795,554

Int. Cl.[4] B29C *63/26;* **B32B** *31/26*

U.S. Cl. 156—245 **4 Claims**



1. A method of making a liner section for use in a rotary pulverizer comprising the steps of positioning a plurality of flat ceramic tiles onto the bottom surface in a mold with clearance spaces between the respective tiles, pouring liquid cast polyurethane into the mold to fill said clearance spaces and provide a layer of polyurethane above said tiles to form a slab, curing said slab, positioning said slab into a second mold having a layer of rubber therein, molding said slab and said layer of rubber to shape said rubber layer into a concave form, and curing said slab and said layer of rubber into an integral unit.

4,678,531

METHOD AND APPARATUS FOR SCREEN PRINTING SOLDER PASTE ONTO A SUBSTRATE WITH DEVICE PREMOUNTED THEREON

David B. Metzger; Glenn S. Johnson, both of Kokomo, and Michael D. Bramel, Summitville, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1986, Ser. No. 843,030

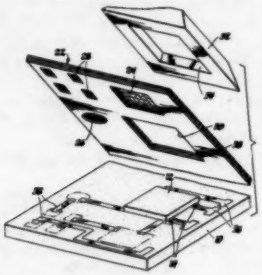
Int. Cl.[4] B32B *31/12;* **B05C** *17/06;* **B05D** *5/12*

U.S. Cl. 156—250 **10 Claims**

1. A method for screen printing an electrical fabrication substance onto a substrate surface to which a device having substantial height relative to the thickness of the printing screen has been previously mounted comprising the steps of:

(a) preparing a printing screen to permit through-flow of said bonding substance only in one or more pre-selected areas;

(b) forming a hole in said screen of such size and location as to conform to said device;
(c) bonding a substance-impervious cap to the screen so as to cover said hold and said device;
(d) laying said screen over said substrate with the device being disposed within said hole;
(e) and thereafter applying said substance to the exposed surface of said screen to cause said substance to flow through said pre-selected areas.



4. Apparatus for applying an electrical fabrication substance by screen printing to selected areas of a surface of a substrate to which a device of substantial height relative to the printing screen thickness has previously been mounted comprising:
(a) a printing screen for overlying said substrate surface and which is impervious to the through-flow of said substance except in one or more pre-selected areas; said screen having an aperture formed therein to accommodate said device; and
(b) a substance-impervious cap for covering said device bonded to said screen over said aperture.

4,678,532

TREATMENT OF WOOD VENEERS IN PLYWOOD MANUFACTURING

David A. Perry, and Richard D. Stratton, both of Pineville, La., assignors to Perkins Industries, Inc., Overland Park, Kans.

Filed Mar. 21, 1985, Ser. No. 714,437
Int. Cl.[4] C09J *5/04*
U.S. Cl. 156—314 **14 Claims**

1. A method of treating wood veneer in the manufacture of plywood to reduce the amount of adhesive required in the plywood, said method comprising the steps of:
drying the veneer;
applying to the veneer a wetting agent that is comprised of water;
allowing the veneer to stand for a preselected time period sufficient to permit the water to evaporate and be absorbed by the veneer,
applying adhesive to the veneer surface after elapse of said time period in an amount related to the water absorbed by the veneer; and
applying heat and pressure to the veneer to form plywood.

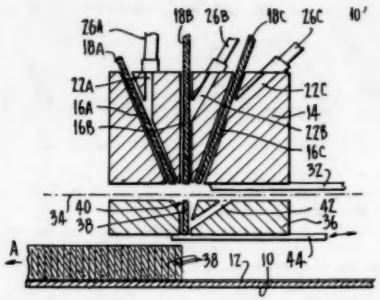
4,678,533

APPARATUS FOR TUFTING YARN BITS

Ian G. Bartlett, Grovedale, and Donald A. Lymer, Highton, both of Australia, assignors to Tybar Engineering Pyt. Ltd., Australia

Filed Mar. 1, 1985, Ser. No. 707,463
Claims priority, application Australia, Mar. 7, 1984, PG3952
Int. Cl.[4] D04H *1/00*; B32B *5/00*
U.S. Cl. 156—435 **4 Claims**

1. An apparatus for manufacture of carpet, said apparatus including at least one yarn outlet situated above an adhesive covered backing, said at least one outlet including at least one guide means for guiding yarn through said at least one outlet from a yarn supply, a cutting device for severing said yarn emerging from said at least one outlet, a manifold extending across the width of said adhesive covered backing, said manifold having a plurality of said guide means therein along the length of said manifold and each guide means being connected to a respective yarn supply, at least one further set of guide means extending along the length of said manifold, said at least one further set of guide means being aligned with said plurality of guide means with yarn emerging from said at least one further set of guide means adjacent respective outlets of said plurality of guide means, an air channel adapted to be connected to a compressed air supply leads into each guide means



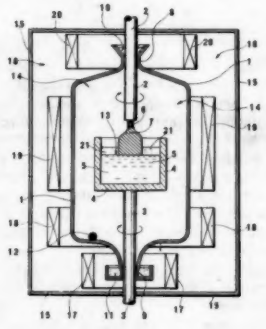
and forces said yarn through each guide means and an assembly block located between said manifold and said adhesive covered backing, said assembly block including a yarn bit collection zone located below aligned outlets of said plurality of guide means and said at least one further set of guide means, said assembly block including a dispenser means to control guidance of respective cut yarn bits onto said adhesive covered backing, said yarn bit collection zone being a plurality of funnel-shaped bores and said dispenser means including a moveable slide underneath said assembler block to control the movement of yarn bits through each respective funnel-shaped bore, and a further air channel opening into each funnel-shaped bore to force said yarn bits from each funnel-shaped bore.

4,678,534

METHOD FOR GROWING A SINGLE CRYSTAL

Koji Tada; Masami Tatsumi; Toshihiro Kotani, and Shinichi Sawada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 13, 1985, Ser. No. 733,361
Claims priority, application Japan, Jun. 8, 1984, 59-117845
Int. Cl.[4] C30B *27/02*
U.S. Cl. 156—607 **4 Claims**



1. A method for growing a single crystal of compound semiconductors in an apparatus comprising an inner vessel

having a top opening with a top cavity, and a bottom opening with a bottom cavity, and made of a material that does not chemically react with a Group V or Group II element a plurality of heaters each of said heaters surrounding said inner vessel at a vertically different position, an upper shaft passing through said top opening, said upper shaft being able to rotate and move up and down in said inner vessel, a lower shaft passing through said bottom opening, said lower shaft being able to rotate and move up and down in said inner vessel, a crucible supported by said lower shaft, and an outer vessel which encloses said inner vessel and said heaters, said method comprising the steps of:

charging compound semiconductor material, and an encapsulant material into said crucible,

placing a lump of an element of group V or group II in said inner vessel,

charging encapsulant materials into said top and bottom cavities,

supplying an inactive gas into said inner vessel and said outer vessel,

sealing said inner vessel by heating the encapsulant materials in said top and bottom cavities to form liquid encapsulants,

melting the encapsulant material in said crucible to form crucible liquid encapsulant and melting the compound semiconductor material in said crucible to form a material melt covered with the crucible liquid encapsulant,

heating the lump of the element of group V or group II to keep the partial pressure Q_O of the gas of the element of group V or group II equal to or larger than the dissociation pressure Q_d of the element of group II or group V at a temperature for seeding,

controlling the total gas pressure in said inner vessel so as to be equal to or greater than the gas pressure in said outer vessel,

dipping a seed crystal into said material melt and,

pulling up a single crystal.

4,678,535

PROCESS FOR PRODUCING CRYSTALS

Hermenegild Mang, and Günter Engel, both of Graz, Austria, assignors to Avl Gesellschaft für Verbrennungskraftmaschinen und Messtechnik mbH, Graz, Austria

Continuation-in-part of Ser. No. 479,081, Mar. 25, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,303

Claims priority, application Austria, Mar. 30, 1982, 1260/82

Int. Cl.[4] **C30B** *29/14, 7/10;* **C01B** *25/26*

U.S. Cl. 156—623 R **4 Claims**

1. A process for producing single cyrstals which have a comprehensive chemical formula of APO_4, symbol A being a chemical element selected from Al and Ga, P being phosphorus, and O being oxygen, said process comprising the steps of

(1) preparing a solution of aluminum or gallium phosphate in 12.5–20 molar phosphoric acid and saturating said solution at a temperature of at least 110° C. and less than 190° C.,

(2) providing steam over said solution prepared in step (1) at a pressure equal to or greater than the prevailing static vapor pressure to maintain the actual acid concentration of said solution within the range of 12.5 to 20 mol/l,

(3) raising the temperature of said solution by at least 10° C. in increments of 0.1° to 3° C. per day, starting from the saturation temperature in step (1), until a temperature which is still below 190° C. is reached, and

(4) during steps (1) to (3), maintaining the total pressure over said solution at about atmospheric pressure until said crystals are formed from said solution.

4,678,536

METHOD OF PHOTOCHEMICAL SURFACE TREATMENT

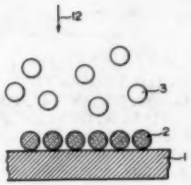
Seiichi Murayama, Kokubunji; Kanji Tsujii, Tokyo, and Yusuke Yajima, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 799,976

Claims priority, application Japan, Nov. 21, 1984, 59-244444

Int. Cl.[4] **H01L** *21/306;* **B05D** *3/06;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 156—635 **4 Claims**



1. A method of photochemically treating a surface of a material, comprising the steps of:

introducing a reaction gas into a reaction chamber having a substrate therein, to make the reaction gas be adsorbed on the surface of said substrate; and

exposing said substrate to radiation of a wavelength at which the absorption of radiation energy by the reaction gas existing in the inner space of said reaction chamber is negligibly small and the radiation energy is absorbed by the reaction gas adsorbed on the surface of said substrate, the kind of the reaction gas and the wavelength of the radiation being selected so that the surface of a predetermined material forming a pattern on said substrate can be selectively treated.

4,678,537

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

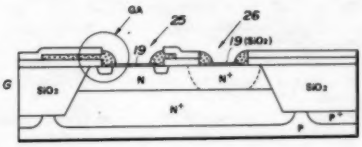
Norikazu Ohuchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,295

Claims priority, application Japan, May 23, 1985, 60-111249; May 23, 1985, 60-111250; May 23, 1985, 60-111251

Int. Cl.[4] **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **20 Claims**



1. A method of manufacturing a semiconductor device, which comprises the following steps of:

(a) forming a first insulating layer on a semiconductor substrate including at least one active area;

(b) selectively forming a first conductive layer on said first insulating layer;

(c) forming a second insulating layer on said first conductive layer;

(d) forming at least one window through said first and second insulating layers and said first conductive layer on said active area of which peripheral portion is perpendicular to a surface of said semiconductor substrate;

(e) forming a third insulating layer on said active area exposed through said active area window;

(f) forming an oxide resistant layer all over said semiconductor substrate;

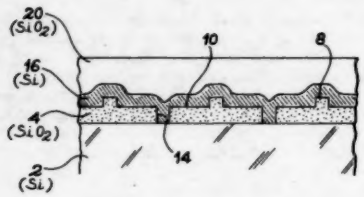
(g) anisotropicly etching said oxide resistant layer so as to leave said oxide resistant layer only at a side wall portion of said window;
(h) oxidizing said semiconductor substrate with said remaining oxide resistant layer as a mask to change said third insulating layer to a fourth insulating layer; and
(i) selectively etching said remaining oxide resistant layer and said third insulating layer just under said remaining oxide resistant layer to form a minute gap on the surface of said active area for connecting said active area to said first conductive layer to be connected to an electrode of said semiconductor device.

4,678,538

PROCESS FOR THE PRODUCTION OF AN INSULATING SUPPORT ON AN ORIENTED MONOCRYSTALLINE SILICON FILM WITH LOCALIZED DEFECTS

Michel Haond, Meylan; Daniel Bensahel, Grenoble, and Didier Dutartre, Meylan, all of France, assignors to Etat Francais Represente Par le Ministre des Ptt, Centre National d'Etudes des Telecommunications, Issy Les Moulineaux, France

Filed Apr. 21, 1986, Ser. No. 853,906
Claims priority, application France, Apr. 19, 1985, 85 06000
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **12 Claims**



1. a process for the production of a monocrystalline silicon film on an insulating support comprising the following successive stages:
(a) covering a monocrystaline silicon substrate of given orientation with an insulating material layer,
(b) forming in the insulating layer, by a first etching thereof, overhanging strips and recessed strips, which are parallel and alternate, with an orientation close to an orientation (100) of the substrate, the widths of the overhanging strips being smaller than that of the recessed strips,
(c) producing a second etching of the insulating layer in order to locally form at the ends of said layer at least one opening, said second etching being continued until the substrate is exposed,
(d) depositing on the etched insulating layer a silicon film,
(e) covering the silicon film with a layer of an encapsulating material,
(f) carrying out a heat treatment of the structure obtained in order to recrystallize the silicon film in monocrystalline form with the same orientation as the insulating strips and,
(g) eliminating the encapsulating material layer.

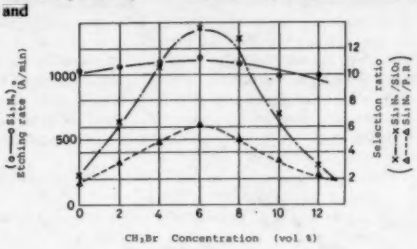
4,678,539

DRY-ETCHING METHOD

Kazuyuki Tomita, Osaka, and Masuo Tanno, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 19, 1985, Ser. No. 799,657
Claims priority, application Japan, Nov. 20, 1984, 59-244945
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **9 Claims**

1. A dry-etching method for etching silicon nitride having steps of:
setting an etched material of said silicon nitride into a reaction chamber,
supplying a mixed gas as an etching gas, which is made of carbon fluoride, oxygen and another gas having such a molecular structure that a part of hydrogen of hydro-carbon is replaced by bromine, into said reaction chamber, and



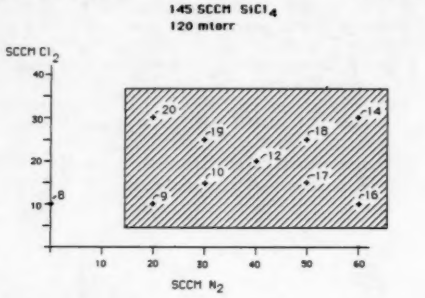
giving high frequency electric power so as to make said mixed gas as plasma state and to etch said etched material.

4,678,540

PLASMA ETCH PROCESS

David H. Uchimura, Chandler, Ariz., assignor to Tegal Corporation, Novato, Calif.

Filed Jun. 9, 1986, Ser. No. 872,073
Int. Cl.[4] B44C *1/22*
U.S. Cl. 156—643 **6 Claims**



1. In a process for etching aluminum material through a mask, and the mask erodes during the process, by contacting the aluminum material with a plasma formed in a first gaseous etchant, the improvement comprising the steps of:
forming a sloping, non-vertical sidewall on the exposed edges of said mask; and then
supplying a nitrogen, second gaseous etchant which reacts selectively with said mask; and simultaneously
supplying a chlorine, third gaseous etchant which reacts selectively with said material; and
controlling the proportion of said supplied second and third etchants to produce a predetermined transfer of slope from said mask to the sidewall formed in said material.

4,678,541

BATHS AND PROCESS FOR CHEMICAL POLISHING OF STAINLESS STEEL SURFACES

Daniel Tytgat, and Pierre Lefèvre, both of Brussels, Belgium, assignors to Solvay & Cie. (Société Anonyme), Brussels, Belgium

Filed Jun. 2, 1986, Ser. No. 869,726
Claims priority, application France, Jun. 3, 1985, 85 08440
Int. Cl.[4] C23F *1/00;* **B44C** *1/22*
U.S. Cl. 156—664 **10 Claims**

1. Baths for chemical polishing of stainless steel surfaces, comprising, in aqueous solution, a mixture of hydrochloric acid, phosphoric acid, and nitric acid, which are characterized in that they comprise, in the aqueous solution, ferricyanide

complex ions and an additive capable of decomposing nitrous acid.

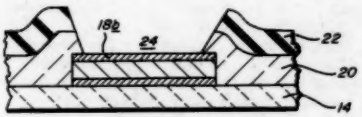
7. Process for polishing a stainless steel surface, according to which the surface is placed in contact with a chemical polishing bath, characterized in that a bath according to claim 1 is employed.

4,678,542

SELF-ALIGNMENT PROCESS FOR THIN FILM DIODE ARRAY FABRICATION

Willem D. Boer, and Atsushi Kawasaki, both of Troy, Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jul. 25, 1986, Ser. No. 889,159
Int. Cl.[4] B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—659.1 **24 Claims**



1. In a process for the fabrication of an array which includes a plurality of micron-scale solid state circuit elements operatively disposed in a preselected pattern on the first surface of a large area substrate, said elements including a body of thin film semiconductor alloy material sandwiched between substantially aligned electrodes, the improved method including the steps of:

providing a substrate capable of transmitting a level of radiation sufficient to activate a superposed radiation sensitive film;

forming the elements such that the opacity thereof prevents the transmission of a level of radiation capable of activating a superposed radiation sensitive film;

depositing a thin insulating film over the elements and interstitial first surface of the substrate;

depositing a radiation sensitive film over the thin insulating film;

irradiating the surface of the large area substrate opposite the first surface;

developing and processing the activated radiation sensitive film so as to expose a portion of the insulating film overlying the elements; and

etching the exposed insulating film so as to expose a portion of the electrode overlying the elements, whereby an electrical contact to said overlying electrode may be established without the necessity of masking.

4,678,543

APPARATUS FOR PRODUCING ETHANOL

Heinz Houben, Möchengladbech; Hans U. Petzoldt, Leverkusen, and Joachim Stegemann, Hürth-Hermülheim, all of Fed. Rep. of Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Division of Ser. No. 471,785, Mar. 3, 1983. This application Jan. 20, 1984, Ser. No. 572,662

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208743; Feb. 3, 1983, 3303571

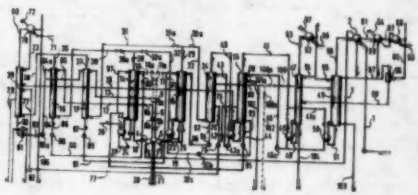
Int. Cl.[4] B01D 3/16, 3/36; C07C 29/80
U.S. Cl. 202—154 **32 Claims**

1. Apparatus for the production of ethanol comprising:

(a) first means defining a first fluid flow path and including a first distillation unit having no reflux means and having a first distillation inlet for an alcohol-containing substance, and a first distillation outlet for an alcohol-enriched product, said first means further including a first rectifying unit separate from said first distillation unit and having a first reflux means, a first rectifying inlet connected with said first distillation outlet, and a first rectifying outlet for an alcohol-rich product;

(b) second means defining a second fluid flow path and including a second distillation unit having no reflux means and having a second distillation inlet for an alcohol-containing substance, and a second distillation outlet for an alcohol-enriched product, said second means further including a second rectifying unit separate from said second distillation unit and having a second reflux means, a second rectifying inlet connected with said second distillation outlet, and a second rectifying outlet for an alcohol-rich product, said second distillation unit and said second rectifying unit each being distinct from said first units;

(c) third means for admitting a first quantity of an alcohol-containing substance into and conveying the first quantity along said first fluid path, and for admitting a second



quantity of an alcohol-containing substance into and conveying the second quantity along said second fluid path;

(d) fourth means for admitting process heat into one of said fluid paths at a single location thereof, said heat admitting means constituting the sole source of process heat for said apparatus; and

(e) fifth means for effecting transfer of the process heat between said first and second fluid paths to thereby define a third flow path for at least one portion of the process heat, said third flow path passing through said units in succession in the order of said first distillation unit, said second distillation unit, said first rectifying unit and said second rectifying unit.

4,678,544

PROCESS FOR THE SEPARATION OF 2MBA FROM MIPK

Lawson G. Wideman, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 28, 1986, Ser. No. 834,687
Int. Cl.[4] B01D 3/34, 3/36
U.S. Cl. 203—95 **4 Claims**

1. A process for the distillative separation of 2-methylbutanal from a mixture consisting of from 5 to 85 parts by weight of methylisopropylketone and from 15 to 95 parts by weight of 2-methylbutanal, said process consisting of adding water to said mixture in an amount from 5 to 50% by weight based on the weight of the mixture prior to the distillative separation, then the mixture is distilled in a distillation column which is operated under conditions of temperature and pressure such that a 2-methylbutanal/water azeotrope is taken overhead and thereafter the resultant 2-methylbutanal/water distillate is phase separated to isolate essentially pure 2-methylbutanal.

4,678,545

PRINTED CIRCUIT BOARD FINE LINE PLATING

George M. Galik, 3236 Falcon Ridge Rd., Diamond Bar, Calif. 91765

Filed Jun. 12, 1986, Ser. No. 873,519
Int. Cl.[4] C25D 5/02
U.S. Cl. 204—15 **26 Claims**

1. A method for uniformly electroplating a conductive substrate comprising:

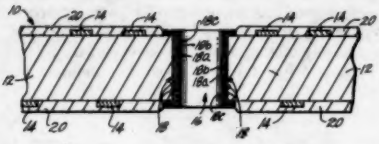
providing a tank containing an electroplating solution;

immersing at least one anode in the electroplating solution;

immersing a conductive substrate in the electroplating solution at a location spaced apart from the anode;

immersing an electrically conductive screen in the electroplating solution, the screen extending across the electroplating tank between the anode and the substrate; and

by means of a direct current source, simultaneously establishing a first potential difference between the anode and



the substrate for electrolytically depositing metal onto the substrate and a second potential difference between the anode and the screen, wherein the second potential difference is less than the first potential difference and the screen voltage is less positive than the anode voltage to thereby minimize the difference between the current density at the center of the substrate and at the periphery of the substrate.

4,678,546

PROCESS FOR PROVIDING LITHIUM TANTALUM OXIDE COATED TANTALUM ARTICLES WITH IMPROVED WEAR RESISTANCE

Liu Yu-Zhong, Beijing, China, assignor to North China Research Institute of Electro-Optics, Beijing, China

Filed Mar. 27, 1985, Ser. No. 716,803

Int. Cl.[4] C25D *11/34*

U.S. Cl. 204—32.1 **16 Claims**

1. A process for making an article made of a metal selected from the group consisting of tantalum, niobium and an alloy of tantalum and niobium coated with a film comprising polycrystalline lithium-containing metal oxide, the process comprising:

(a) cleaning the surface of the metal article to remove surface impurities by:

(i) washing with an organic solvent;

(ii) etching with a solution of a strong acid selected from the group consisting of hydrofluoric acid and a mixture of hydrofluoric acid and nitric acid under an applied anodic voltage; or

(iii) a combination of the above;

(b) immersing the cleaned article in a bath of an oxygen containing inorganic salt of lithium at a high temperature in the range of 400° C. to 580° C., and applying an anodic voltage in the range of about 3 to 50 volts to maintain a current density of about 2 to 20 mA/cm^2 for a period of about 0.1 to 10 hours to form said film on the surface of the article; and

(c) post-treating the article by:

(i) aging at a temperature of about 170° C. to 400° C. for about 1 to 4 hours;

(ii) immersing the article in a solution of about 0.05% by weight of phosphoric acid and ethylene glycol at a temperature of about 90° C. to 100° C. and applying anodic voltage of about 500 volts to 600 volts for about 1 to 3 hours;

(iii) immersing in dilute phosphoric acid at room temperature and applying an anodic voltage of about 350 volts to about 600 volts for at least 0.5 hours; or

(iv) a combination of the above steps.

4,678,547

ANODIZED MEMORY DISK SUBSTRATE AND METHOD OF MANUFACTURING THE SAME

Mitsuya Miyamoto, Kamakura; Yasuyuki Ooseki, Hiratsuka, and Motohiro Nabae, Nikko, all of Japan, assignors to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1986, Ser. No. 903,480

Claims priority, application Japan, Sep. 4, 1985, 60-193953

Int. Cl.[4] C25D *5/50*

U.S. Cl. 204—37.1 **6 Claims**

1. An anodized memory disk substrate having an anodic film thereon which has excellent hardness and heat resistance, said film having a thickness of not less than 3 μm, and said anodized memory disk being produced by the process of:

(a) anodizing a substrate of aluminum or aluminum alloy at a temperature of from 30 to 90° C. and at a voltage of from 25 to 90V in a mixed acid solution comprising 10 to 200 g./l. of chromic acid and 0.1 to 50 g./l/ of sulfuric acid to form the anodic film having a film thickness of not less than 4 μm on the surface of the substrate,

(b) polishing said anodized substrate so as to leave behind the anodic film with a film thickness of at least 3 μm, and before or after said polishing,

(c) heating said anodized substrate for not less than 10 minutes at a temperature in the range of 150 to 450° C.

4,678,548

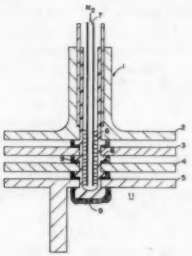
CORROSION-RESISTANT SUPPORT APPARATUS AND METHOD OF USE FOR INERT ELECTRODES

Melvin H. Brown, Allegheny Township, Allegheny County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 21, 1986, Ser. No. 887,637

Int. Cl.[4] C25C *3/10*

U.S. Cl. 204—67 **9 Claims**



8. A method for protecting an electrode positioning member from corrosive attack while immersed in a chemical bath, said positioning member being composed of an electrically nonconductive material and having an inside surface forming an internal cavity, comprising:

(a) passing a clear coolant through said cavity along said inside surface; and

(b) establishing wire in said cavity positioned normal to the path of said coolant and further positioned to provide a direct line of sight between said wire and said inside surface, said wire having a radiative absorptance and emittance of at least about 0.5.

4,678,549

PROCESS FOR MAKING AMINO ALCOHOLS BY ELECTROCHEMICAL REDUCTION OF NITRO ALCOHOLS

Maurice Rignon, Givry; Jean-Claude Catonne, La-Celle-Saint-Cloud; Francoise Denisard, Elancourt, and Jean Malafosse, Saint Marcel, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

Filed Feb. 10, 1986, Ser. No. 828,558

Claims priority, application France, Feb. 11, 1985, 85 01873

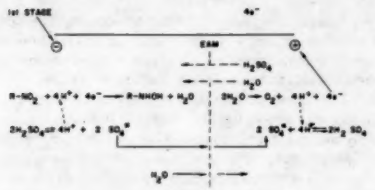
Int. Cl.[4] C25B *3/04*; B01D *13/02*

U.S. Cl. 204—74 **13 Claims**

1. A process for producing amino alcohols by electrochemi-

cal reduction of nitro alcohols in an electrodialysis apparatus having an anode compartment containing an anolyte comprising a dilute solution of sulfuric acid and a cathode compartment containing catholyte, the anode compartment being separated from the cathode compartment by an ion exchange resin, comprising:

a. a first step of reacting a sulfuric acid solution of the nitro alcohol to form a hydroxylamine at the cathode, the cathode being made of a material having a strong hydrogen overpotential;



b. reducing the hydroxylamine from the first step at a cathode having a higher electronegative potential than the cathode in the first step to form an amino alcohol;

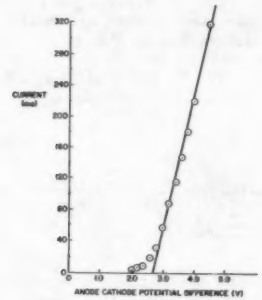
c. purifying the solution of amino alcohol produced by electroelectrodialysis and removing concentrated sulfuric acid present in the anode compartment by eliminating water therefrom.

4,678,550

OBTAINING ACCURATE AMOUNTS OF MERCURY FROM MERCURY COMPOUNDS VIA ELECTROLYTIC METHODS

Mark W. Grossman, Belmont, and William A. George, Rockport, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 31, 1985, Ser. No. 815,146
Int. Cl.[4] C25C *1/00*
U.S. Cl. 204—105 R **18 Claims**



1. A method for obtaining a pre-determined quantity of Hg, which comprises:

(a) dissolving a quantity of HgO in an electrolyte solution resulting in the dissociation of HgO and the formation of mercuric ions in solution, said electrolyte solution comprising glacial acetic acid and H_2O, said quantity of HgO being sufficient to provide the pre-determined quantity of Hg plated on a cathode at an electrolyte cell upon substantially complete electrolytic reduction and plating thereof;

(b) placing an anode and a cathode into the electrolyte solution;

(c) applying an electric voltage across the anode and cathode, said electric voltage causing an electric current to flow from the anode through the electrolyte solution to the cathode, whereby mercuric ions are reduced and elemental Hg is plated onto said cathode;

(d) continuing to apply the electric voltage across the anode and cathode until the reduction of Hg ions is complete; and thereafter

(e) recovering said cathode with the pre-determined quantity of Hg thereon.

4,678,551

PROCESS FOR PRODUCING AN ALUMINUM SUPPORT FOR A LITHOGRAPHIC PRINTING PLATE

Haruo Nakanishi; Hirokazu Sakaki; Toru Yamazaki, and Yoshio Okishi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 10, 1985, Ser. No. 786,023
Claims priority, application Japan, Oct. 11, 1984, 59-212916; Oct. 11, 1984, 59-212917
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.75 **14 Claims**

1. A process for producing an aluminum support for a lithographic printing plate, comprising chemical graining of at least one side of an aluminum plate with an etching solution so as to form an average center-line roughness of from 0.3 to 1.3 μm, wherein the etching solution is an aqueous solution containing a mineral acid and from 40 to 95% by weight with respect to the saturation concentration of the mineral acid an unsaturated concentration of an aluminum salt of a mineral acid.

4,678,552

SELECTIVE ELECTROLYTIC STRIPPING OF METAL COATINGS FROM BASE METAL SUBSTRATES

Johnson C. Chen, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 22, 1986, Ser. No. 855,043
Int. Cl.[4] C25F *5/00*
U.S. Cl. 204—146 **7 Claims**

1. A process for the selective electrolytic stripping of metal coatings selected from nickel, chromium, tin, lead, tin/lead alloy, cobalt, cadmium, aluminum, or mixtures thereof from a base-metal substrate selected from copper and its alloys and zinc and its alloys consisting essentially of immersing said coated base-metal substrate into an aqueous electrolyte solution of from about 45 to about 70 weight percent of an alkanesulfonic acid of 1 to 4 carbons wherein said coated metal-base substrate is the anode and an electroconductive material is the cathode, impressing a direct current voltage across said electrolyte solution between the electrodes until the current decreases to about zero which occurs when the metal coating on the anode is completely stripped off leaving the base-metal substrate exposed.

4,678,553

RENATURING REVERSIBLY DENATURED POLYPEPTIDES AND PROTEINS BY ELECTRODIALYSIS OF SOLUTIONS THEREOF IN DENATURANTS

Robert J. Mandle, Lexington, Mass., and Wayne A. McRae, Zurich, Switzerland, assignors to Ionics, Incorporated, Watertown, Mass.

Filed Jul. 11, 1986, Ser. No. 884,942
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.6 **15 Claims**

1. A process for recovering at least one substantially renatured polypeptide from a solution of said polypeptide and/or its S-sulfonate derivative reversibly denatured in aqueous denaturant, said process comprising:

(a) introducing said solution of said polypeptide and/or its S-sulfonate derivative into at least one renaturant compartment of an electrodialysis apparatus, said compartment defined by membranes each of which is substantially permeable to low molecular weight singly charged ions of at least one charge sign and substantially impermeable to said polypeptides and S-sulfonate derivatives, said membranes also defining rinsing compartments juxtaposed on each side of said renaturant compartment;

(b) introducing second aqueous solutions into said juxtaposed rinsing compartments, said second solutions adapted in combination with said membranes to permit reduction of the chaotropy of said denaturant in said renaturant compartment upon the application of a direct electric current in at least one of the possible directions through said renaturant compartment and said juxtaposed rinsing compartments in series;

passing a substantially direct electric current in series through said renaturant compartment and said juxtaposed rinsing compartments in a direction to cause reduction of the chaotropy of said denaturant in said renaturant compartment thereby reducing the chaotropy of said denaturant in said solution of polypeptide and/or S-sulfonate derivative to a level characterized by its ability to permit at least partial refolding of such polypeptide and/or S-sulfonate derivative which level is not less than that which would result in substantial precipitation of said polypeptide and/or its S-sulfonate derivatives out of said solution at pH's in the range of from about 4 to about 10 , which pH's do not substantially decrease the solubility of said polypeptide and/or S-sulfonate derivative at said chaotropy level;

(d) maintaining the pH of said solution of polypeptide and-/or S-sulfonate derivative during electrodialysis at pH's in the range of from about 4 to about 10 which pH's are characterized by not substantially decreasing the solubility of said polypeptide and/or S-sulfonate derivatives at said reduced chaotropy level; and

(e) removing from said renaturant compartment a solution of said polypeptide and/or S-sulfonate derivative having a substantially reduced chaotropy level.

4,678,554

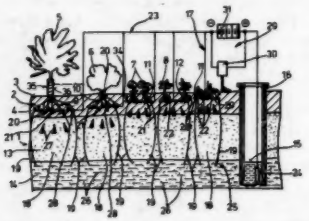
METHOD AND INSTALLATION FOR GENERATING AN ELECTRICAL FIELD IN THE SOIL

Hans Oppitz, Mils, Austria, assignor to ELTAC Nogler & Daum KG, Innsbruck, Austria

Continuation of Ser. No. 704,138, Feb. 21, 1985, abandoned, which is a continuation of Ser. No. 464,721, Feb. 7, 1983, abandoned. This application Jan. 31, 1986, Ser. No. 825,055

Int. Cl.[4] B01D *13/02;* **C25B** *11/0*

U.S. Cl. 204—299 R **16 Claims**



1. An installation for generating an electrical field of a large area in soil having a vegetation zone between the ends of roots of plants in the soil and the surface of the soil, which comprises at least one cathode having a high conductivity and a low transition resistance arranged in the vegetation zone, each one of the cathodes being a flexible net comprised of threads defining meshes of a sufficient size to accommodate the plants therein, the threads of the net being comprised of a core material selected from the group consisting of polyamide, acrylic resin and polyester, containing carbon or metal filaments embedded in an electrically conductive synthetic resin, an anode arranged in a deeper zone of the soil at a greater distance from the soil surface than each one of the cathodes, and an electrical conductor system connecting each one of the cathodes to the anode to enable an electric current to flow therebetween.

4,678,555

PREPARATION OF CELLULOSE ACETATE MEMBRANE AND ITS USE FOR POLAR SOLVENT-OIL SEPARATION

David L. Wernick, Elizabeth, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 561,287, Dec. 14, 1983, Pat. No. 4,541,972. This application Jul. 11, 1985, Ser. No. 754,005

Int. Cl.[4] C10G *21/28;* **B01D** *13/00*

U.S. Cl. 208—36 **5 Claims**

1. A process for separating dewaxing solvent from dewaxed oil comprising the steps of contacting the dewaxed oil-dewaxing solvent combination under pressure with a cellulose acetate membrane wherein the cellulose acetate membrane is a cellulose 1.7–1.8 acetate membrane prepared by the steps of:

(a) dissolving 5 to 40 weight percent cellulose 1.7–1.8 acetate polymer in a dual casting solvent system comprising 15 to 50 weight percent solvent A and 20 to 80 weight percent solvent B wherein solvent B is a nonsolvent for the polymer while solvent A is either a solvent or nonsolvent for the polymer, but the mixture A plus B is a solvent for the polymer;

(b) casting a film using the solution of step (a);

(c) evaporating a portion of the more volatile solvent A from the film; and

(d) gelling the partially evaporated film in a gelation solvent C which does not dissolve the polymer but is miscible with solvents A and B and further wherein the solvent combination of B+C is a nonsolvent for the polymer, wherein solvent A possesses three dimensional solubility parameters in the range of δ_D32 7 to 10, δ_P=1 to 10 and δ_H=6 to 12 and solvents B and C possess three dimensional solubility parameters in the range of δ_D=7 to 10, δ_P=0 to 10 and δ_H=<2.5, wherein all δ's are in $(cal/cm^3)^{\frac{1}{2}}$.

4,678,556

METHOD OF PRODUCING LUBE STOCKS FROM WAXY CRUDES

Michael S. Hicks, West Deptford, and David L. Vannauker, Woodbury Heights, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,200

Int. Cl.[4] C10G *55/06, 73/06*

U.S. Cl. 208—96 **19 Claims**

14. A process for dewaxing lube feedstocks and for extending the cycle length of the dewaxing process, comprising the steps of:

(a) solvent dewaxing a waxy hydrocarbon feedstock having a pour point of 100° to 160° F., whereby high quality waxes are removed to produce a hydrocarbon stock having a first intermediate pour point;

(b) catalytically dewaxing said first intermediate pour point hydrocarbon stock by contacting said first intermediate pour point hydrocarbon stock with a crystalline silicate of the structure of ZSM-5 in the presence of added hydrogen at a temperature between 500° and 675° F. to remove a percentage of a wax contained in said lube oil stock to produce a hydrocarbon stock having a second intermediate pour point; and

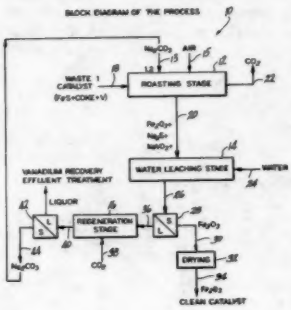
(c) solvent dewaxing said second intermediate pour point hydrocarbon stock to produce a lube base stock having a targeted pour point of about 0° to 20° F.

4,678,557

PROCESS FOR THE REGENERATION OF SPENT CATALYST USED IN THE UPGRADING OF HEAVY HYDROCARBON FEEDSTOCKS

Domingo Rodriguez, San Antonio de Los Altos, and Roberto Schemel, Los Teques, both of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Sep. 9, 1985, Ser. No. 773,802
Int. Cl.[4] C10G 47/04, 47/06; B01J 23/94
U.S. Cl. 208—112 8 Claims



1. A process for the regeneration of a spent natural iron base catalyst used in the upgrading of heavy hydrocarbon feedstocks comprising:

providing a spent natural iron base catalyst containing carbon, sulfur and vanadium as impurities;

roasting said catalyst at a temperature of not more than 400° C. in the presence of a carbonate selected from the group consisting of sodium, potassium and mixtures thereof so as to eliminate carbon from said catalyst and obtain a roasted product comprising iron oxide and water soluble salts of sulfur and vanadium;

water leaching said roasted product to dissolve the soluble salts of sulfur and vanadium; and

separating said catalyst from said leaching liquor so as to obtain a regenerated catalyst substantially free of carbon and sulfur.

8. A hydrocracking process for the upgrading of a heavy crude feedstock comprising:

hydrocracking said hydrocarbon feedstock in the presence of a natural iron base catalyst wherein said catalyst becomes contaminated with carbon, sulfur and vanadium;

roasting said contaminated catalyst at a temperature of not more than 400° C. in the presence of a carbonate selected from the group consisting of sodium, potassium and mixtures thereof so as to eliminate carbon from said catalyst and obtain a roasted product comprising iron oxide and water soluble salts of sulfur and vanadium;

water leaching said roasted product to dissolve the soluble salts of sulfur and vanadium;

separating said catalyst from said leaching liquor so as to obtain a regenerated catalyst substantially free of carbon and sulfur; and

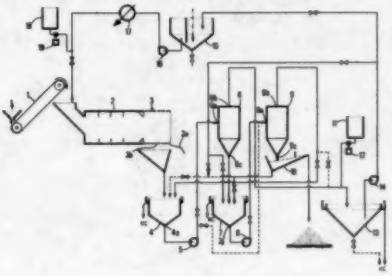
recycling said regenerated catalyst to the hydrocracking stage.

4,678,558

METHOD USABLE IN PARTICULAR FOR WASHING AND DESORBING SOLID PRODUCTS CONTAINING HYDROCARBONS

Jean-Pierre Bellutesu, Noisy le Rio; Christian Bocard, Orgeval; Christian Such, Orsay, and Daniel Vaillant, Antony, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Laboratoire Central des Ponts et Chausses, Paris, both of, France

Filed Jul. 3, 1985, Ser. No. 751,589
Claims priority, application France, Jul. 4, 1984, 84 10730
Int. Cl.[4] C10G 1/04
U.S. Cl. 208—390 11 Claims

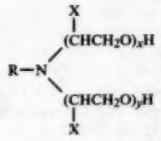


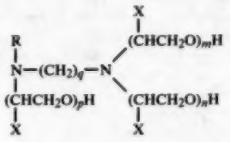
1. A method for separating hydrocarbons from a mixture comprising sand, gravel, and hydrocarbons, said method comprising:

(a) contacting said mixture with an aqueous desorbent present in an amount between 0.5–5 wt% inclusive with respect to said sand, said aqueous desorbent comprising:

(1) water;

(2) 3–50 wt% with respect to said desorbent of a surfactant selected from group consisting of the following general formulae:





wherein:

R is a linear aliphatic of 12–22 carbons,

(x+y)=2–15,

(m+n+p)=2–15,

q=2–6, and

X is hydrogen or methyl; and

(3) 50–97% wt with respect to said desorbent of a solvent for said hydrocarbon;

and 0.15 wt% with respect to said sand of a caustic material so as to alter basicity of the resulting mixture and form an aqueous phase, a desorbed hydrocarbon phasse, and a washed sand and gravel phase;

(b) removing gravel from said sand and gravel phase leaving a washed sand product;

(c) separating said said product from adhering water and

hydrocarbons by at least one cyclone separation with a water/sand weight ratio between 2–15 so as to form an overflow stream comprising said hydrocarbons and an underflow comprising said sand; and

(d) separating said overflow stream by decantation to recover said hydrocarbons in an overflow stream from residual sand in an underflow stream.

4,678,559

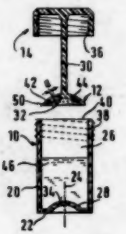
TEST SPECIMEN CONTAINER FOR PASTY SPECIMEN MATERIAL

Andreas Szabados, Otto-Heilmann-Strasse 2, D-8022 Gruenwald, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,348

Int. Cl.[4] B03B *7/00*; **G01N** *1/28, 33/48*

U.S. Cl. 209—17 **22 Claims**



1. Sample-taking vessel for pasty sample material to be distributed in a suspension fluid within said vessel (**10**), said vessel including a vessel body having an open end (**40**) and a closed end (**22**) spaced from the open end and a first direction extending between the open and closed ends and including a vessel side wall (**20**) extending between the open end and the closed end in the first direction, and a vessel lid (**14**) for closing the open end, a sample-taking cup (**12**), said cup extending transversely of the first direction of said vessel and substantially filling the cross-section of said vessel transversely of the first direction, said cup (**12**) comprising a cup wall (**42**) extending transversely of the first direction with sieve openings (**44**) extending therethrough with the width of the openings being in the range of 0.5 to 2 mm, a stem extends in the first direction between and connects said cup and said vessel lid, said cup having an interior formed by an inner side (**32**) facing toward the closed end of said vessel, an elevation (**28**) formed in the closed end of said vessel and projecting into said vessel in the first direction toward the open end, said elevation having a surface (**34**) facing toward the open end substantially complementary to the inner side of said cup, said cup having an outer side opposite said inner side and facing toward the open end of said vessel said inner side being arranged to seat over its full surface in contact with the surface of said elevation when said vessel lid closes the open end of said vessel, said cup having a circumferential edge (**50**) spaced inwardly from said vessel side wall (**20**) and forming with said vessel side wall an annular gap (**52**) having a width not greater than the width of the sieve openings in said cup wall.

4,678,560

SCREENING DEVICE AND PROCESS

Kjell A. Stole; Arnstien Lovsland, and Egil Havig, all of Lillesand, Norway, assignors to Norton Company, Worcester, Mass.

Filed Aug. 15, 1985, Ser. No. 765,778

Int. Cl.[4] B07B *9/00, 3/00*

U.S. Cl. 209—23 **19 Claims**

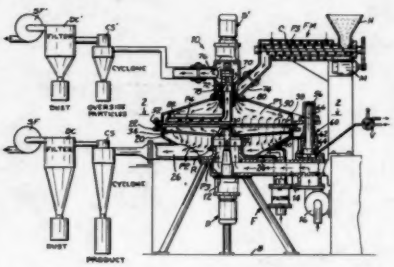
16. A method of screening and separating particulate material comprising the steps of:

supporting a screen with openings of predetermined uniform size therein substantially horizontally between an upper receiving chamber of an upper receiving housing and a lower collecting chamber of a lower collecting housing;

distributing particulate material into the upper receiving chamber and onto the screen;

rotating an air distributor rotor having at least one slotted hollow elongated radial air distributing arm in the lower collecting chamber, with an upper elongated slot therein located below and spaced from the screen;

supplying and passing a first air flow at a predetermined volume and pressure into each rotating radial air distributing arm and out through the slot therein and out the openings in the screen to fluidize the particulate material collecting on the screen and into the upper receiving chamber whereupon it is drawn downwardly and helps disperse the distributed particulate material onto the screen and passes with the undersize particles through openings in the screen and into and out of the lower collecting chamber; drawing the first air flow and an additional second air flow of lower volume together into the lower collection



chamber wherein the first and second air flows are combined and flow together to remove and carry the undersize particles through and out of the collecting chamber and create a lower air pressure in the lower collecting chamber whereby the first flow of air and any additional second outside air entering the upper receiving chamber at a higher pressure helps to disperse the distributed particles and is drawn downwardly to help gravity carry the undersize particles through the openings in the screen;

periodically stopping distribution of the particulate material into the upper receiving chamber and drawing of the second air flow into the lower collecting chamber;

rotating a slotted tubular oversize particle collector arm, with an elongated bottom slot therein, in the upper receiving chamber and above the screen; and

drawing a third air flow of sufficient volume and pressure into and through the collector arm to draw, remove, and carry the oversize particles from the screen, and out of the upper receiving chamber.

4,678,561

PROMOTERS FOR FROTH FLOTATION OF COAL

Robert O. Keys, Columbus, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Division of Ser. No. 585,176, Mar. 1, 1984, Pat. No. 4,589,980, which is a continuation-in-part of Ser. No. 434,243, Oct. 14, 1982, abandoned, and a continuation-in-part of Ser. No. 434,244, Oct. 14, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 830,374

Int. Cl.[4] B03D *1/06*

U.S. Cl. 209—166 **12 Claims**

1. In a froth flotation process wherein solid coal particles are selectively separated under coal froth flotation conditions as a froth phase from remaining solid feed ash particles as an aqueous phase in the presence of a coal particle collector and a frother, the improvement charcterized by the addition of an

effective proportion of a hydrophobic, non-ionic promoter comprising a C_{10}–C_{30} nitrile or polynitrile thereof.

4,678,562

PROMOTORS FOR FROTH FLOATATION OF COAL

Robert O. Keys, Columbus, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Division of Ser. No. 585,176, Mar. 1, 1984, Pat. No. 4,589,980, which is a continuation-in-part of Ser. No. 434,243, Oct. 14, 1982, abandoned, and Ser. No. 434,244, Oct. 14, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 830,572

Int. Cl.⁴ B03D *1/06*

U.S. Cl. 209—166 **9 Claims**

1. In a froth flotation process wherein solid coal particles are selectively separated under coal froth flotation conditions as a froth phase from remaining solid feed ash particles as an aqueous phase in the presence of a coal particle collector and a frother, the improvement characterized by the addition of an effective proportion of a hydrophobic, non-ionic promoter comprising a C_{12}–C_{30} fatty alcohol or its C_3 or higher alkoxylated derivative.

4,678,563

MODIFIED ALCOHOL FROTHERS FOR FROTH FLOTATION OF SULFIDE ORE

Robert O. Keys, Columbus, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Filed May 7, 1985, Ser. No. 731,713

The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.

Int. Cl.⁴ B03D *1/14*

U.S. Cl. 209—166 **13 Claims**

1. In a froth flotation process for concentration of a metal sulfide ore in the froth by subjecting an aqueous slurry of metal sulfide ore particles to sulfide ore froth flotation under sulfide ore froth flotation conditions comprising a metal sulfide ore collector, the improvement which comprises using an effective amount of a frothing agent selected from the group consisting of:

(a) the reactant product of a C_5–C_{10} diol and a C_1C_7 carboxylic acid in a ratio of one mole of carboxylic acid per mole of diol and having the predominant structural formula of

$$HO-(C_nH_{2n})-O-\overset{\overset{O}{\|}}{C}-(C_xH_{2x})-H$$

where n=5–10 and x=0–6;

(b) the reaction product of a C_5–C_{10} diol and an acrylonitrile in a mole ratio of one mole of acrylonitrile to one mole of diol such that the reaction product retains at least one hydroxyl group and having the predominant structural formula of

$$HO-(C_nH_{2n})-O-CH_2\overset{\overset{(C_mH_{2m+1})}{|}}{C}H-C\equiv N$$

where n=5–10 and m=0–3;

(c) the reaction product of between about 1 and 10 moles of a C_2–C_3 alkylene oxide per mole of a C_1–C_7 carboxylic acid and having the predominant structural formula of

$$H-(C_xH_{2x})-\overset{\overset{O}{\|}}{C}-O-(C_yH_{2y}O)_z-H$$

where x=0–6, y=2–3, and z=1–10;

(d) the reaction product of between about 1 and 10 moles of a C_2–C_3 alkylene oxide and one mole of a C_5–C_{10} diol and having the predominant structural formula of

$$HO-(C_nH_{2n})-O-(C_yH_{2y}O)_z-H$$

where n=5–10, y=2–3, and z=1–10; and

(e) mixtures thereof.

4,678,564

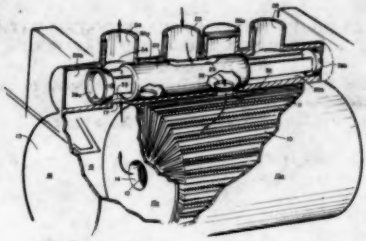
CAST FILTER AND AUTOMATIC SELF-CLEANING BACKFLUSH CONTROL SYSTEM THEREFOR

Jack F. Moorehead, San Diego, and Richard S. Campbell, Sr., El Cajon, both of Calif., assignors to Fairchild Filter Corporation, La Jolla, Calif.

Filed Nov. 15, 1985, Ser. No. 798,610

Int. Cl.⁴ B01D *27/12*

U.S. Cl. 210—108 **22 Claims**



1. In a filter, the combination comprising:

(a) structure providing a porous barrier between a first zone from which liquid to be filtered is supplied, and a second zone to which filtered liquid flows, via said barrier,

(b) said barrier including a series of elements defining grooves, and filtering media between said elements defining grooves, and filtering media between said elements and communicating with said grooves, said elements include first elements which are longitudinally elongated, and have generally rectangular cross sections in lateral planes, and second elements which are longitudinally elongated, and have wedge-shaped cross section in lateral planes, the grooves extending generally width-wise of said elements, said first elements sequentially alternate with said second elements, said filtering media comprises a membrane a membranes which extend in undulating folds between said first and second elements,

(c) said grooves of said first element being for reception of liquid flow therein from said first zone so that liquid flows from said grooves of said first barrier through said media,

(d) said groves in said second barrier being presented for of flow from said media and for subsequent flow via said second barrier grooves to said second zone.

(e) control means for providing backflushing of said filter only as requried, as an alternative to periodic backflushing.

16. Filter apparatus, comprising:

(a) structure providing a porous barrier between a first zone from which liquid to be filtered is supplied, and a second zone to which filtered liquid flows, via said barrier,

(b) control means communicating with said zones for controlling the direction of unfiltered liquid flow therebetween, via said barrier,

(c) said control means for providing backflushing of said porous barrier only as required, as an alternative to periodic backflushing, including a liquid pressure sensor, and valving that reverses the direction of said flow between said zones in response to operation of said sensor to sense build-up of a liquid pressure differential between such zones, above a predetermined level

(d) actuator structure for said valving and including a first piston surface responsive to fluid pressure application to displace the valving in one direction to filtering position,

and a second piston surface responsive to fluid pressure application to displace the valving in the opposite direction to backflush position,

(e) control fluid pressure connections including control valves to control fluid pressure application to one or the other of said piston surfaces as a function of the fluid pressure differential as between said zones,

(f) and means operatively connected with said control fluid pressure connections to slow the movement of said valving as it moves between backflush position and normal filtering position.

4,678,565

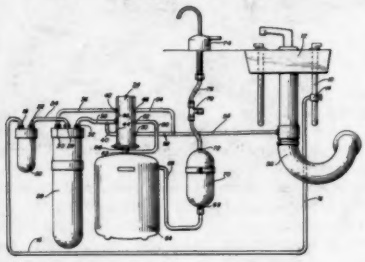
PURIFIED WATER STORAGE SYSTEM WITH ACCUMULATOR TANK AND DIAPHRAGM RESPONSIVE VALVES

William W. Norton, Lincolnshire, Ill., assignor to Culligan International Company, Northbrook, Ill.

Filed Jan. 17, 1986, Ser. No. 819,799

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—110 **8 Claims**



1. A purified water supply system which comprises:

a reverse osmosis device having a reverse osmosis membrane, an inlet, a purified water outlet, and a reject water outlet;

means for coupling the reverse osmosis device inlet to a supply of unpurified water;

water regulating means having inlets coupled to said purified water outlet and said reject water outlet, said water regulating means having a first outlet and a second outlet;

first means coupling said first outlet to drain;

only one accumulator tank having an inlet and an outlet;

means coupling said outlet to said accumulator tank inlet;

means coupling said accumulator tank outlet to a household faucet;

said water regulating means comprising a pair of valves movable in response to pressure in the accumulator tank for automatically directing a first amount of water from said purified water outlet to said first outlet and thereafter automatically discontinuing flow of the water to said first outlet and directing flow of the water from said purified water outlet to said second outlet;

said valves including means for providing two different configurations depending upon pressure in the accumulator tank;

including means a diaphragm responsive to pressure in the accumulator tank for direct mechanically linked operation of said valves without requiring another accumulator tank;

said water regulating means being operative to couple said reject water outlet to drain.

4,678,566

APPARATUS FOR SEPARATING PROTEINS FROM BLOOD PLASMA

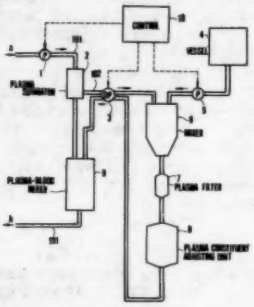
Masaharu Watanabe, Tama, and Hiroaki Ohe, Fuji, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,713

Claims priority, application Japan, Jul. 20, 1984, 59-149311; Sep. 7, 1984, 59-187805

Int. Cl.[4] B01D *21/00;* **C07K** *3/21*

U.S. Cl. 210—143 **6 Claims**



1. An apparatus for separation and removal of proteins from blood plasma, comprising:

a vessel containing an agent for the precipitative separation of proteins from blood plasma, said agent comprising a mixture of an alkaline metal salt and an amino acid in an amount sufficient to promote a fractional precipitating effect of the alkaline metal salt with respect to plasma protein, said amino acid being selected from the group consisting of neutral amino acid, aspartic acid, cystine, N-acetyltryptophan, tyrosine and mixtures thereof;

means for introducing plasma into said vessel;

means for separating and removing a precipitate formed inside said vessel by bringing the separating agent and the plasma into contact therein; and

means for removing at least some of the separating agent constituent from a plasma component which remains following removal of the precipitate.

4,678,567

ACTIVATED SLUDGE PROCESS BED

Iwao Ueda, Kyoto, Japan, assignor to Iwao Ueda and Chie Ueda, both of Kyoto, Japan

Filed Jul. 18, 1986, Ser. No. 886,922

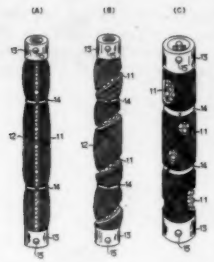
Claims priority, application Japan, Jul. 24, 1985, 60-114458[U]

Int. Cl.[4] C02F *3/06*

U.S. Cl. 210—150 **2 Claims**

1. In an activated sludge process bed in which a mesh-like or grid-like outer periphery of a cylindrical core composed of a hard synthetic resin resistant to corrosion over a long period of immersion in sewage water, said cylindrical core being wrapped with a porous member formed of a corrosion resistant synthetic resin, said core being tightened by tightening means, the improvement comprising: the outer periphery of the cylindrical core is not completely wrapped with the porous member but is partially exposed in a specified form, thereby ensuring communication between the inside and outside of the activated sludge process bed, said specified form being within a group consisting of a structure wherein (A) no more than one-third of an outer periphery of the cylinder is longitudinally exposed,

(B) a certain width of the outer periphery of the cylindrical core is spirally exposed and (C) plural portions of the porous



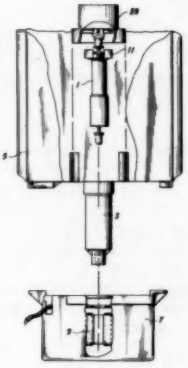
member are irregularly cut out so that exposed portions of the outer periphery of the cylindrical core are scattered.

4,678,568

MULTI-USE AQUARIUM MAINTENANCE SYSTEM

Jerome Goldman, New York; Marvin Goldman, Great Neck; Gerald Phillips, Glen Cove, and Terry Goldman, New York, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.

Filed Jun. 11, 1985, Ser. No. 743,348
Int. Cl.[4] E04H *3/16*
U.S. Cl. 210—169 **17 Claims**



1. In an aquarium maintenance apparatus having the conventional components including

(a) an electrically powered means for suctioning water;

(b) a filter case removably attached to the water suction means in a manner so that the suctioned water enters the filter case.

(c) a lift tube formed of a segment of plastic tubing, removably attached to the water power suction means at a point inside the filter case in a manner which draws suctioned water through the lift tube, the lift tube having an open end within the filter case to allow the entry of the suctioned water from an aquarium into the filter case and an opposite opened end which may be placed inside the aquarium;

(d) a means for allowing the suctioned water to return to the aquarium, from the filter case, formed on the filter case

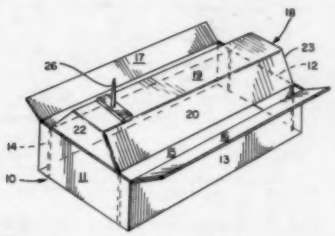
the improvement comprising: enabling the maintenance apparatus to function as a multi-use aquarium maintanence system by providing a branched section of hollow tubing having a plurality of branches, removably attached to the plastic lift tube to provide two or more branched lift tube segments each having an opened end.

4,678,569

APPARATUS FOR SEPARATING HONEY AND BEESWAX

Howard W. Cunningham, Rte. 1, Box 249-E, Parkersburg, W. Va. 26101

Filed Feb. 28, 1986, Ser. No. 834,963
Int. Cl.[4] B01D *35/18*
U.S. Cl. 210—187 **10 Claims**



1. A beeswax capping separator for recovering honey from beeswax and refuse in cappings, said apparatus comprising:

(1) means designed for inherently regulating the heat within the apparatus by the amount of cappings load in said apparatus such that, at high cappings load, heat is consumed by melting the wax in said cappings and, at low cappings load, heat is inherently vented from said apparatus thereby precluding honey-damaging heat buildup including

(a) a container having an open top, a bottom and side walls defining a chamber in said container;

(b) a cap spaced above the bottom of said container and covering part of the container below it, said cap being spaced from at least one side-wall of said container to define a feed opening therewith, said feed opening being adapted to receive said cappings;

(c) heating means mounted in said chamber beneath said cap for heating cappings in said chamber to melt the beeswax and release the liquid honey from said cappings, the resulting melted beeswax and released liquid honey flowing to form a layer of released liquid honey adjacent the bottom of said container, and a layer of melted beeswax overlying the honey layer;

(2) means for removing the melted beeswax from said container; and

(3) means for removing the released liquid honey from said container, said means for removing melted beeswax and said means for removing honey being adapted to maintain said cappings and layer of melted beeswax at a level spaced below said cap and heating means thereby permitting said cappping to pass beneath said cap and heating means.

4,678,570

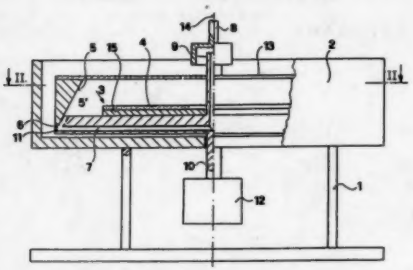
PLANAR CENTRIFUGAL CHROMATOGRAPHY DEVICE

Sàndor Mèszàros; Gisela Verzàr-Petri; Klara Nyiredy-Mikita; Ernö Tyihàk, all of Budapest, Hungary; Szabolcs Nyiredy, Zurich, Switzerland; Beat Meier, Brütten, Switzerland; Otto Sticher, Zurich, Switzerland, and Karin Dallenbach-Toelke, Küsnacht, Switzerland, assignors to Petazon Inc., Zug, Switzerland

Filed Apr. 9, 1986, Ser. No. 849,939
Claims priority, application Switzerland, Apr. 15, 1985, 1588/85; Apr. 15, 1985, 1589/85
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **7 Claims**

1. In a planar centrifugal chromatography device which includes a chamber with a rotating rotor therein constructed as a chromatographical separating element having a support

plate, having an annular adsorbing medium arranged on the support plate, and having a collecting device arranged very close to the outer edge of the rotor within the chamber, the improvement comprising wherein the collecting device and the rotor are mounted fixedly on a common shaft and every individual point on an inner surface of the collecting device is farther from the axis of rotation than the point of the adsorbing medium of the rotor which is the farthest from the axis of



rotation, wherein the distances of the individual points on the inner surface of the collecting device from the axis of rotation vary, and at each point on the collecting device which is farther from the axis than two adjacent points there is arranged an output opening which is connected to an axially extending hollow part of the shaft of the rotor through a discharge channel, and wherein the device has a stationery discharge element which is connected to the hollow part of the shaft.

4,678,571

WATER PURIFIER

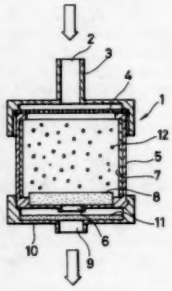
Nobuyoshi Hosaka; Tasuku Shimizu; Kenzo Mikada; Kozo Tamura, and Masatoshi Tanabe, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 830,753

Claims priority, application Japan, Feb. 20, 1985, 60-30323

Int. Cl.[4] C02F *1/28, 1/68*

U.S. Cl. 210—202 **6 Claims**



1. A water purifier comprising a deodorization tank for removing ions and odorants by adsorption from running water, said tank having a water entrance and a water exit, and a mesh filter for removing dusts, said mesh filter being arranged at the water entrance of said deodorization tank, said deodorization tank containing an antibacterial membrane having a function of imparting an antibacterial activity to the water by supplying mineral ions to the running water and thereby alkalifying the water, and the water exit of said deodorization tank being operatively associated with a mineral supply filter for supplying a mineral component to the running water, said mineral supply filter being prepared by molding a powder obtained by adhering a member selected from the group consisting of soda glass, quartz, vermiculite, perlite, pumice, and mixtures thereof to the surface of heat-decomposed calcium carbonate.

4,678,572

VENTED COVER ASSEMBLY WITH FILTER INSERT FOR FLUID RESERVOIR

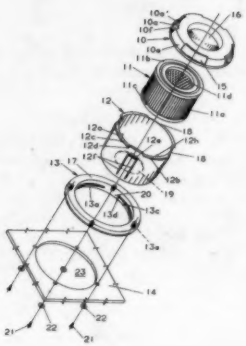
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Continuation of Ser. No. 823,470, Jan. 28, 1986, abandoned, which is a continuation of Ser. No. 701,624, Feb. 14, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,334

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1984, 3405105

Int. Cl.[4] B01D *27/08*

U.S. Cl. 210—232 **15 Claims**



1. A vented cover assembly adapted for attachment to an aperture in a wall of a fluid reservoir, so as to close the aperture while allowing filtered air to pass into and out of the fluid reservoir, the cover assembly comprising in combination:

a socket ring adapted for clamping attachment to the edge of said aperture, the socket ring including a tubular wall portion defining a substantially cylindrical bore of a diameter which is smaller than the width of the aperture, the axis of said bore being oriented substantially perpendicular to the reservoir wall and defining a rotational center axis for the cover assembly;

a generally pot-shaped filter casing having a bottom wall and a adjoining substantially cylindrical side wall cooperating with the bore of the socket ring so as to be insertable therethrough and to extend to the inside of the fluid reservoir, with the bottom wall located at the inner axial end of the side wall;

first bayonet-type locking means defined between the socket ring and the filter casing, for the removable attachment of the filter caisng to the socket ring;

a removable cap at the axially outer end of the filter casing;

second bayonet-type locking means defined between the filter casing and the cap for the removable attachment of the cap to the filter casing; and

a filter cartridge arranged inside the filter casing and positioned between the bottom wall of the filter casing and the removable cap, the filter cartridge having an air-permeable filter wall; and wherein

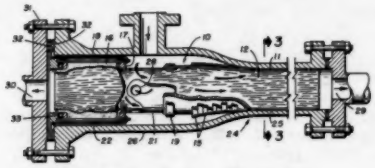
the filter casing has in one of its walls a vent opening for the flow of air between the inside of the fluid reservoir and one side of the filter wall ofthe filter cartridge, and the cap has a vent opening for the flow of air between the outside of the fluid reservoir and the other side of said filter wall.

4,678,573

FLUID SEPARATION MODULE

Roger S. Otstot, and Charles J. Runkle, both of Wake County, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 332,911, Dec. 21, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,363
The portion of the term of this patent subsequent to Apr. 19, 2000, has been disclaimed.
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.1 8 Claims



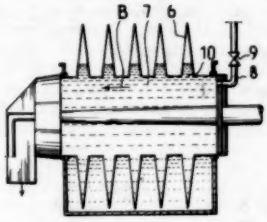
1. A fluid separation module, comprising
(a) a cylindrical shell having an inner surface having a predetermined diameter,
(b) a bundle of hollow fiber membranes positioned in said shell,
(c) a tube sheet positioned at one end of the bundle of hollow fibers, said fibers extending through the tube sheet,
(d) a sheet having the form of a slit tube surrounding the bundle of fibers, said sheet having sufficient resiliency that when free of restraint the slit tube will of its own expand into contact with the inner surface of the cylindrical shell, and
(e) means in contact with the slit tube for holding said slit tube in a tubular configuration, said means being manually moveable relative to the slit tube so that said slit tube can be freed of restraint to expand into contact with the inner surface of the cylindrical shell.

4,678,574

DISC FILTER

Tapani Niiranen, Savonlinna; Erkki Savolainen, Haapakallio, and Raimo Kohonen, Savonlinna, all of Finland, assignors to Enzo-Gutzeit OY, Helsinki, Finland

Filed Dec. 3, 1985, Ser. No. 804,349
Claims priority, application Finland, Dec. 3, 1984, 844765
Int. Cl.[4] B01D *33/26*
U.S. Cl. 210—327 5 Claims



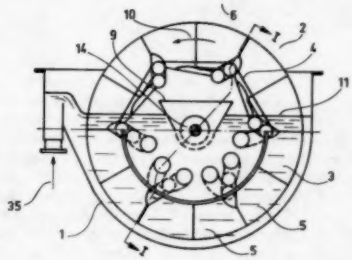
1. A method comprising removing filtrate from a disc filter for filtering fluids containing fiber-like solid materials for increasing the speed of rotation of the disc filter retarded by the presence of a vacuum therein and thereby increasing the capacity of the disc filter, by providing the filter having an axially extending central shaft forming an axially extending central channel (7), a plurality of hollow discs are arranged serially along the axial direction of and extend radially outwardly from the central shaft, the discs each include a number of sectors (6) extending radially outwardly from the central shaft and communicating with the central channel through apertures (10), the central shaft having a first end and a second end spaced apart in the axial direction and defining the opposite ends of the central channel (7), rotating the disc filter through a body of fluid containing fiber-like material and having a fluid level so that the lower half of the disc filter is below the fluid level and the upper half of the disc filter is above fluid level, sucking the fluid out of the central passage at the first end of the central channel, and at the same time placing the sectors (6) and the central channel (7) located above the fluid level in communication with at least one of ambient air and blowing air therein.

4,678,575

ROTATABLE FILTER DISC ASSEMBLY

Rune H. Frykhult, Huddinge, Sweden, assignor to AB Celleco, Sweden

Continuation-in-part of Ser. No. 523,590, Aug. 16, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 755,784
Claims priority, application Sweden, Aug. 20, 1982, 8204770; Feb. 10, 1983, 8300708; Feb. 28, 1983, 8301082
Int. Cl.[4] B01D *33/26*
U.S. Cl. 210—327 15 Claims



1. In a rotatable filter assembly for separation of fibers from a fiber suspension and including in combination, a plurality of annular filter discs each comprising a plurality of filter elements, a horizontal drum, means for rotating said drum about an axis, said filter discs being mounted on said drum in substantially parallel, axially spaced relation to each other, a container for said fiber suspension in which said drum is rotatable, each filter element being a hollow chamber having walls of filter cloth and radially inner and outer ends, means for each of said chambers defining a filtrate outlet at the radially inner end of each of said chambers, said drum being generally cylindrical and including a series of discharge tubes extending in an axial direction, said tubes forming a grating-like mantle wall of the drum, each hollow chamber communicating through its filtrate outlet with a discharge tube, and a collecting hopper extending into the drum through an open end thereof and surrounded by said filter discs, said hopper having an upwardly facing entrance opening extending along all of said filter discs, the interior of each filter element being subjected to a lower pressure than that outside said element during part of the drum's revolution, the improvement in which said discharge tubes, as seen in a cross-sectional view transverse to said axis, are arranged in a plurality of groups each including at least two tubes, the spacing between adjacent tubes in each group being substantially less than the spacing between adjacent groups.

4,678,576

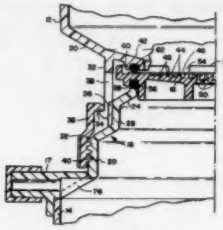
REUSABLE FILTER UNIT WITH RECOVERABLE FILTER MEMBRANE

Richard A. Leoncavallo, Pittsford, N.Y., assignor to Nalge Company, Rochester, N.Y.

Continuation of Ser. No. 505,609, Jun. 20, 1983, abandoned, which is a continuation of Ser. No. 302,823, Sep. 16, 1981, abandoned. This application Jun. 7, 1985, Ser. No. 715,853
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—433.2 10 Claims

1. A reusable filter unit, comprising a lower body forming a receptacle for receiving a filtrate and having an upstanding

collar terminating in a circular rim portion defining an open top of the lower body, an upper body forming a reservoir for receiving liquid to be filtered and having an inwardly extending internal shoulder defining a lower outlet of the upper body and a dependent cylindrical flange disposed outwardly of and around said internal shoulder terminating in a lower end, said flange having an inside surface, a perforated support plate supported between the upper and lower bodies upon said circular rim portion having an upper surface for supporting a filter membrane thereon, characterized in that the cylindrical



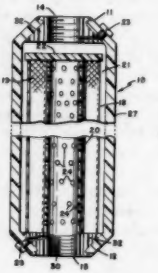
flange has a retaining shoulder which extends radially outwardly of the lower end of the flange, said upstanding collar having external threads and also an intermediate portion which extends into the flange so as to engage the inside surface of said flange as said lower and upper bodies are pulled axially together, and a rotatable locking ring having internal threads is retained on the flange by the retaining shoulder and is engagable with the external threads on the collar so as to draw the upper body into contact with the support plate and with the lower body in releasable clamping engagement without relative rotation of the upper and lower bodies.

4,678,577

SEAMLESS VESSEL FOR SELF CONTAINED FILTER ASSEMBLY

Dwight J. Thomas, Zionsville, and Charles J. Ashelin, Lebanon, both of Ind., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Aug. 27, 1985, Ser. No. 769,927
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—441 **8 Claims**



1. A filter assembly comprising:

a. a seamless main cylindrical vessel having wall portions with opposite conical shaped end portions and formed from a thermoplastic polymer material,

b. means defining a fluid inlet opening in one of said end portions and means defining a filtrate discharge outlet at the other end portion of said vessel,

c. a filter media arranged within said vessel,

d. a molded base section of thermoplastic polymer material in each of said end portions integrally merged to said wall portions of said vessel end portions, and

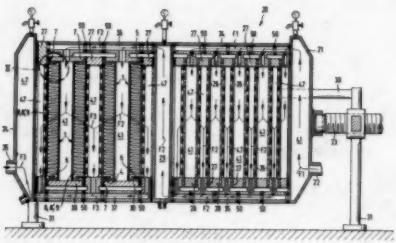
e. at least one end of said filter media integrally molded to one of said base sections in sealed position within said vessel.

4,678,578

FLAT FILTER ELEMENT FOR THE FILTRATION OF FLUIDS

Rudolf Nodes, Böblingen, and Jürgen Hoffmann, Hardegsen-Ellierode, both of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,574
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406735
Int. Cl.[4] B01D *27/06*
U.S. Cl. 210—445 **15 Claims**

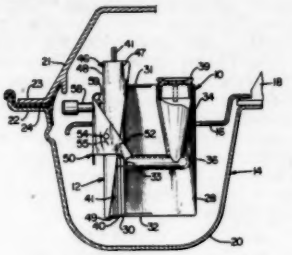


1. In a filter element for equipping framelike sections of a sheet filter device for filtration of flowing fluids, wherein a filter element is clamped by its edge in a leakproof and sandwichlike manner between a housing part on a sediment chamber side and a housing part on a filtrate chamber side, and is supported against a pressure gradient on a draining housing support plate whereby said sediment chamber and said filtrate chamber are provided with connections for supplying and emptying housing chambers, the improvement wherein said filter element is characterized by a replaceable flat selectively permeable filter element (**1**) formed by a flat filter band with parallel folds of folding openings (**2**, **2'**) and, web backs (**3**, **3'**) said flat filter band is adapted to inner dimensions of a housing part (**30**) in length, width and depth and is pleated into a plurality of close folds, in which open folds (**2**) and web backs (**3**) of one side of a pleating face of a sediment chamber and open folds (**2'**) and web backs (**3'**) of a second side face of a filtrate chamber and the pleating of at least a single-layer filter band blank (**8**, **8'**, **9**), which pleating is formed to a flat cuboid is bordered in a framelike manner by a plastic seal on an edge to form a leakproof separation of sediment chamber (**41**) from filtrate chamber (**47**), said seal circumferentially surrounds two end fold sections (**4**) of said pleating and two front sides (**5**) of said pleating, and is provided with a plastic formed sealing flange (**7**) with which a filter cassette is formed and is clamped between housing parts (**27**, **30**), and whereby support gridwork (**10**, **11**) or foils (**13'**, **13''**) running transversally to fold edges are anchored at least on one side of the filter element (**1**) by their ends in two sides of circumferential plastic seal (**6**) located opposite one another and running parallel to the fold edges for stability and to influence flow.

4,678,579
DISPOSABLE UNITARY CYTOLOGY CHAMBER AND FILTER CARD FOR CENTRIFUGATION OF FLUID SAMPLES AND METHOD OF MAKING SAME

Daniel V. Griffin, Denver, Colo., assignor to Whale Scientific, Inc., Commerce City, Colo.

Filed Dec. 5, 1984, Ser. No. 678,262
Int. Cl.[4] B10D *23/00*
U.S. Cl. 210—477 16 Claims



7. In a centrifuge wherein a plurality of filters are mounted on a rotating carrier, each said holder having clamping means for releasably receiving a cytology chamber and a microscopic slide therein, the improvement comprising:

said cytology chamber defined by a disposable sample chamber having a liquid sample-receiving funnel and an end flange with a discharge port extending between said funnel and said flange;

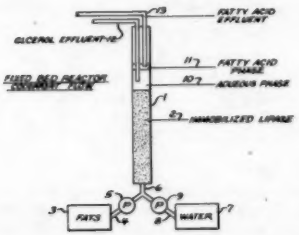
a filter card overlying said end flange including an opening therein; and

securing means for permanently affixing said filter card to said end flange with said opening in said card aligned with said discharge port whereby said filter card is integrally united to said end flange and cannot be removed from said end flange without leaving segments of said filter card attached to said end flange, each said chamber positioned in one of said holders, and said clamping means releasably clamping said slide in overlying relation to said filter card.

4,678,580
HYDROLYSIS OF FATS

Catherine D. Brady, Downers Grove; Lincoln D. Metcalfe, Lagrange; Dale R. Slaboszewski, Joliet, and Dieter Frank, Naperville, all of Ill., assignors to Akzo America Inc., New York, N.Y.

Division of Ser. No. 823,114, Jan. 27, 1986, Pat. No. 4,629,742.
This application Oct. 14, 1986, Ser. No. 899,279
Int. Cl.[4] B01D *25/04*
U.S. Cl. 210—490 4 Claims



1. A diaphragm suitable for use in the hydrolysis of fats comprising:

a. a first layer comprising of a hydrophobic filter cloth having openings from about 3 to about 5 microns in size;

b. a second layer adjacent to said first layer comprising fibers of a hydrophobic microporous thermoplastic polymer, having lipase immobilized on said fibers by adsorption from an aqueous solution either without pretreatment or following pretreatment of said fibers only by wetting with a polar water miscible organic solvent in which said polymer is insoluble and which does not deactivate said lipase; and

c. a third layer adjacent to the side of said second layer opposite said first layer comprising a retaining means capable of maintaining said fibers of said second layer in place.

4,678,581
POLYMETHYL METHACRYLATE HOLLOW FIBER TYPE ULTRAFILTRATION MEMBRANE AND PROCESS FOR PREPARATION OF THE SAME

Tatsuo Nogi; Tomonori Iwami, and Kazumi Tanaka, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

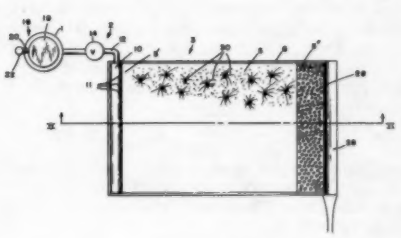
PCT No. PCT/JP82/00422, § 371 Date Jun. 30, 1983, § 102(e) Date Jun. 30, 1983, PCT Pub. No. WO83/01632, PCT Pub. Date May 11, 1983
Continuation of Ser. No. 517,517, Jun. 30, 1983, abandoned.
This PCT application Oct. 28, 1982, Ser. No. 773,524
Claims priority, application Japan, Oct. 30, 1981, 56-173099; May 14, 1982, 57-80268
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.23 15 Claims

1. A hollow fiber structure ultrafiltration membrane of substantially uniform cross section comprising a material of the polymethyl methacrylate series, said material being a mixture of a polymer rich in isotacticity and a polymer rich in sindiotacticity, said polymer having a molecular weight of 100,000 to 2,000,000 and containing substantially no ion pairs so that substantially no crosslinking is formed, and said membrane having a permeability of albumin of not less than 90% and a water UFBS of 2 to 30 l/hr·m^2.mmHg.

4,678,582
TREATMENT SYSTEM FOR LANDFILL LEACHATE

Ronald L. Lavigne, Norwich Lake, Huntington, Mass. 01050

Filed Jan. 24, 1986, Ser. No. 822,125
Int. Cl.[4] C02F *3/32, 3/04*
U.S. Cl. 210—150 8 Claims



1. System for treating landfill leachate comprising:

(a) a leahate supply source,

(b) a treatment basis which slopes from a high end to a low end, and which includes a water impervious liner,

(c) a particulate treatment medium which includes peat moss to provide a substantially large surface area to enhance the fixation and proliferation of microbes and to support plants for growth,

(d) leachate tolerant plants growing in the treatment medium,

(e) inlet flow control means operatively connected to the leachate supply and the treatment basin and comprising:

(1) a perforated tube at the high end of the treatment

medium which extends across the width of the treatment medium,

(2) a conduit connecting one end of the tube to the leachate supply source, and

(3) a flow control valve in the conduit for introducing leachate to the upper portion of the treatment medium at the high end of said treatment basin which allows the leachate to penetrate and flow vertically and horizontally through the treatment medium, and

(f) outlet flow control means for draining the treated leachate from the treatment medium at the low end of the basin and for collecting the drained treated leachate at a point below said treatment medium said outlet flow control means comprising:

(1) a collection trough at the low end of said basin and below said treatment medium, and

(2) a drainage medium of relatively large coarse particles between the treatment medium and the collection trough.

4,678,583

USE OF HYDRATES FOR AQUEOUS SOLUTION TREATMENT

Richard C. Willson, III, Cambridge, Mass.; Eric Bulot, Nesle, France, and Charles L. Cooney, Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 12, 1986, Ser. No. 873,364

Int. Cl.[4] B01D *17/00*

U.S. Cl. 210—638 35 Claims

1. A process for forming a purified solute from an aqueous mixture containing water and a solute comprising forming a mixture of an extractant, a hydrate former and said aqueous mixture, said hydrate former being capable of forming a hydrate with water at temperatures and pressures at which said solute does not form a hydrate, said hydrate former being present in an amount sufficient to permit hydrate formation with water in said aqueous mixture, said extractant being a solvent or adsorbant capable of taking up significant amounts of the solute from water, subjecting said mixture to conditions of temperature and pressure to form a hydrate of said hydrate former with water thereby forming a second mixture comprising a solid portion consisting of water hydrate of said hydrate former, a liquid portion comprising a water solution of said solute, a portion comprising hydrate former and a portion comprising extractant containing concentrated amounts of solute, removing at least some of said extractant portion from said solid portion and said liquid portion and separating said solute from said extractant to form a purified solute.

4,678,584

METHOD OF REMOVING HEAVY METAL FROM WASTEWATER STREAMS

Geraldine S. Elfline, Morrison, Ill., assignor to CX/OXYTECH, Inc., Yorkville, Ill.

Continuation-in-part of Ser. No. 747,008, Jun. 20, 1985, Pat. No. 4,612,125. This application Mar. 24, 1986, Ser. No. 843,109

The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.[4] C02F *1/52*

U.S. Cl. 210—719 19 Claims

1. A method of treating a heavy metal-containing liquid for removal of a substantial portion of heavy metal therefrom without the generation of a substantial quantity of sludge comprising:

contacting said liquid with a water-soluble trithiocarbonate in an amount sufficient to react with said heavy metal and cause precipitation of a substantial portion of insoluble heavy metal from said liquid, and separating the precipitate from the liquid.

4,678,585

PROCESS FOR ALUMINA RECOVERY

Neville J. Brownrigg, Wanneroo, Australia, assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 335,499, Dec. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 171,616, Jul. 23, 1980, abandoned. This application Jun. 20, 1984, Ser. No. 506,099

Int. Cl.[4] C02F *1/54*

U.S. Cl. 210—727 8 Claims

1. A process for flocculating red muds from the Bayer alumina recovery circuit which comprises adding to at least a first stage of the caustic recovery circuit an effective amount of a flocculant selected from the group consisting of starch, homopolymers of acrylic acid or acrylates, copolymers of acrylic acid or acrylates containing at least 80 molar percent acrylic acid or acrylate monomers and combinations thereof and thereafter adding to some subsequent stage or stages of the caustic recovery circuit an effective amount of a copolymer containing from about 35 to 75 molar percent of acrylic acid or acrylate monomers and from about 65 to 25 molar percent of acrylamide monomers.

4,678,586

TREATMENT OF WASH WATER IN PAINT SPRAY BOOTHS

Thomas J. Kearney, 7 Oaklands, Green La, Malvern Wells, Worcester WR14 4JE, England

PCT No. PCT/GB85/00048, § 371 Date Oct. 2, 1985, § 102(e) Date Oct. 2, 1985, PCT Pub. No. WO85/03459, PCT Pub. Date Aug. 15, 1985

PCT Filed Jan. 31, 1985, Ser. No. 784,881

Claims priority, application United Kingdom, Feb. 7, 1984, 8403246

Int. Cl.[4] C02F *1/66*

U.S. Cl. 210—743 7 Claims

1. In a method of treating wash water in a paint spray booth by addition of an alkaline solution including sodium hydroxide to the water for facilitating breakdown of the paint and eventual separation of the paint from the wash water, the improvement which comprises automatically controlling the amount and timing of the addition of alkaline solution to the water according to a predetermined program which includes the steps of establishing with a programmed timer successive water treatment cycles, each cycle lasting for a plurality of days, automatically adding an amount of alkaline solution to the water with a metering pump controlled by said timer during each cycle sufficient to maintain the pH value of the water at a level which minimizes corrosion of metal components of the paint spray booth by the water while the concentration of hydroxide ion in the water does not exceed 0.01M, and introducing, during each treatment cycle, a single discrete dose of alkaline solution that is over half the amount of alkaline solution to be added in that cycle to the water, with the remainder of the alkaline solution to be added in that cycle to the water being introduced at spaced intervals during that cycle.

4,678,587

WATER DISTILLATION METHOD

Jack L. Voinche, P.O. Box 3591, Lafayette, La. 70502, and James C. Martien, 1275 Lurose Dr., Crowley, La. 70526

Filed Dec. 10, 1984, Ser. No. 679,767

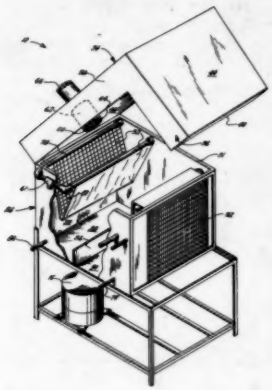
Int. Cl.[4] C02F *1/16*

U.S. Cl. 210—748 12 Claims

1. A method of desalinating water, comprising the steps of:

providing a closed loop refrigeration system, the system comprising a conduit loop through which a refrigerant fluid flows, the system having a cooling portion and a heating portion, wherein the refrigerant fluid in the system is compressed and supplied to a heating element for heating air, the heating element comprising conduit coils in fluid communicating relationship with the fluid in the heating portion of the system, the fluid moving through

the coils of the heating element and thereafter being expanded and passed through a cooling element;
heating the water;
flowing the water over an evaporation screen;
heating a stream of air;
saturating the stream of air with water by passing the stream



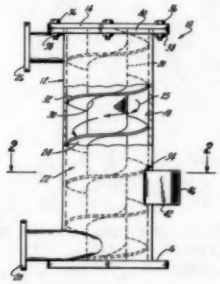
of air through the evaporation screen over which the water is flowing;
passing the stream of saturated air through the cooling element to condense the water therein; and
collecting the condensed water, wherein air which has passed through the cooling element is heated and passed through the evaporation screen.

4,678,588

CONTINUOUS FLOW CENTRIFUGAL SEPARATION

William C. Shortt, 24637 Farmington Rd., Farmington Hills, Mich. 48018

Filed Feb. 3, 1986, Ser. No. 825,620
Int. Cl.[4] B01D *45/12*
U.S. Cl. 210—788 **16 Claims**



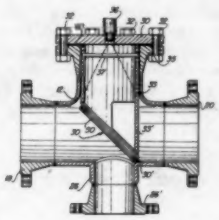
1. A centrifugal separator assembly (**10**) for separating a continuous flow of substances having differing densities along a helical course, said assembly (**10**) comprising:
a closed tubular helical conduit means (**22**) having a predetermined length defining a spiral path having top and bottom walls and for constraining the flow solely along said helical course (**25**) including inlet means (**26**) and outlet means (**28**) situated at opposite terminal ends of said conduit means and leading tangentially into and out of said conduit means, respectively; flow establishing means for establishing a flow velocity along said helical course (**25**) between said inlet means and said terminal outlet means of sufficient force to inertially separate the substances of different densities and form a peripheral fraction; and shearing means for shearing off the entire peripheral fraction of the flow of substance from the remainder of the flow prior to the flow reaching the terminal outlet means, said shearing means including an opening (**34**) extending from said top wall to said bottom wall on said path spaced from said inlet means, said opening being disposed in an inner or outer periphery of said conduit means between said inlet (**26**) and terminal outlet (**28**) means for removing the peripheral fraction of the flow concentrated by centrifugal forces in said inner or outer periphery of said helical course, allowing the unremoved fraction of the flow to continue therealong through said terminal outlet means (**28**).

4,678,589

REMOVABLE IN-LINE SELF-CLEANING STRAINER FOR PIPING SYSTEMS

Walter D. Ayres, Jr., Chicago, Ill., assignor to Surgeaco, Inc., Alsip, Ill.

Filed Mar. 20, 1986, Ser. No. 842,114
Int. Cl.[4] B01D *35/02*
U.S. Cl. 210—797 **14 Claims**



1. In an in-line, inclined strainer device for piping systems, wherein said strainer device comprises a main housing having a hollow interior, a screen-mesh means for entrapping solids and particulates in the liquid flowing in the piping system, means for mounting said screen-mesh means within said main housing in an inclined orientation, said main housing having an inlet opening and an outlet opening with said screen-mesh means being interposed such that the liquid flowing in the piping system flows through said screen-mesh means, wherein the improvement comprises:
said main housing having a hollow extension extending at an angle with respect to the direction of the flow of the liquid through said main housing, said hollow extension cooperating with said hollow interior of the remainder of said main housing;
said means for mounting said screen-mesh means comprising a tubular member for insertion into and removal out of said hollow extension of said main housing, said tubular member mounting said screen-mesh means at one end thereof, said one end being substantially arcuate in cross-section and having a major axis and a minor axis thereof, so that a similarly-shaped screen-mesh means may be mounted directly thereto for insertion in said main housing along the path of flow of the liquid in the piping system;
cover-means for closing the upper end of said tubular member and the upper end of said hollow extension of said main housing;
said one end of said tubular member being elliptical in cross-section; said screen-mesh means comprising a grating of interconnected rods defining a plurality of open spaces,

and a screen-mesh mounted directly to said grating for fixed connection therewith; and

said main housing comprising a drainage-pipe means positioned diametrically opposite to said tubular member, such that said drainage-pipe means is on the other side of said screen-mesh means as compared to said tubular member; said drainage-pipe means comprising means for closing an open end thereof, so that, during self-cleaning of said screen-mesh means, the effluent water carrying away the sediment and particulates may be carried away and drained into a refuse area for subsequent disposal.

4,678,590

SOFTENER COMPOSITION

Kazuhito Nakamura; Hisami Sasaki, both of Yokohama; Masayoshi Chigira, Tokyo, and Kenji Yokoi, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 790,958

Claims priority, application Japan, Oct. 25, 1984, 59-224792

Int. Cl.[4] D06M *13/46*

U.S. Cl. 252—8.8 **17 Claims**

1. A softener composition having improved low temperature viscosity characteristics comprising (a) 7 to 50% by weight of cationic softening agent; (B) 0.05 to 10% by weight of alkylene oxide adducted nonionic surfactant having at least one unsaturated bond in its molecule and wherein the average number of moles of addition of alkylene oxide is 20 to 80; (c) 0.005 to 5% by weight of inorganic electrolyte; and (D) an aqueous vehicle.

4,678,591

TERPOLYMER COMPOSITION FOR AQUEOUS DRILLING FLUIDS

David M. Giddings, Sugar Land, and Charles D. Williamson, Houston, both of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 7, 1986, Ser. No. 848,527

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.514 **3 Claims**

1. A method of improving high temperature fluid loss and rheology stabilization of high calcium brine clay-containing aqueous oil well drilling fluids which comprises adding thereto a stabilizing amount of a water-soluble terpolymer composition comprising: a polymer prepared by polymerizing the following monomer ingredients:

Ingredients	% by Weight
[NaAMPS] 2-acrylamido-2-methyl-propane sulfonic acid, sodium salt	72–3.8
N,N—dimethylacrylamide	13.5–0.7
Acrylonitrile	9.5–0.5

said composition containing lignin, modified lignin, brown coal or modified brown coal in an amount ranging between 5–95% with the brown coal or modified brown coal having been present during the polymerization of the water-soluble polymer, where the lignin, modified lignin, brown coal or modified brown coal is from the group consisting of lignites, sulphonated lignites, lignins, leonardites, lignosulfonates, alkali metal humic acid salts, humic acids, and sulphonated humic acids.

4,678,592

POLYMERS AND LUBRICANT ADDITIVES OF ALKYLENE DITHIOTHIADIAZOLES AND ALKYLENE CYANODITHIOIMIDOCARBONATES

Sameeh S. Toukan, Schuylkill, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 23, 1985, Ser. No. 737,121

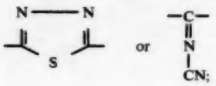
Int. Cl.[4] C10M *103/00, 149/00*

U.S. Cl. 252—25 **9 Claims**

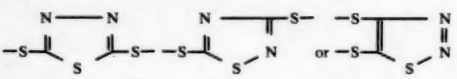
1. A polymeric composition having the formula

wherein

Z is

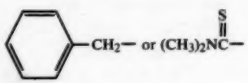


X is

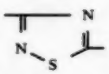


and p is zero or 1, provided that when p is 1 m is zero, n is an integer of 4–100; and

Y is



and m is zero or 1, provided that when m is 1 Z can also be



4,678,593

TRANSPARENT OR TRANSLUCENT TOILET BARS CONTAINING A SMECTITE-TYPE CLAY

Gordon Ridley, Cramlington, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 23, 1986, Ser. No. 889,452

Claims priority, application United Kingdom, Jul. 26, 1985, 8518910

Int. Cl.[4] C11D *9/18, 9/20, 10/04, 17/00*

U.S. Cl. 252—131 **8 Claims**

1. A transparent or translucent toilet bar composition incorporating from about 0.5% to about 10% smectite-type clay, said toilet bar containing from about 45% to about 95% of a soluble alkali metal soap of C_8–C_{24} fatty acids and from 0% to about 45% of a synthetic anionic surfactant, at least about 50% of said soap being in the beta-phase.

4,678,594

METHOD OF ENCAPSULATING A BLEACH AND ACTIVATOR THEREFOR IN A BINDER

Eva H. Parfomak, Wallington, and Winston S. Uchiyama, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 19, 1985, Ser. No. 756,540
Int. Cl.[4] C11D *3/39;* B29C *67/24;* C01B *15/12;* D06L *3/02*
U.S. Cl. 252—186.31 16 Claims

1. A method for preparing a granular detergent additive which contains each of a bleach compound and an activator for said bleach compound encapsulated in a binder, said method comprising

mixing finely divided bleach compound and finely divided activator for said bleach compound,

mixing the mixture of bleach compound and activator compound with a molten, normally solid water-soluble binder,

extruding the resulting mixture, and

cutting the extrudate into granules,

whereby said bleach compound and activator compound in said granules will not react with each other until the granules are added to water at a temperature which will dissolve said binder.

4,678,595

CARPET SHAMPOO OR UPHOLSTERY CLEANING COMPOSITION

Arshad H. Malik; Allen D. Urfer; Robert S. McDaniel, and Donald L. Johnson, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 26, 1985, Ser. No. 769,631
Int. Cl.[4] C11D *1/83, 3/37*
U.S. Cl. 252—174.17 5 Claims

1. A liquid detergent composition suitable for use as a carpet shampoo and/or as an upholstery cleaning formulation, said composition comprising:

a. from about 1 to about 50 parts by weight of a surfactant ingredient which comprises, on a surfactant ingredient weight basis, from about 5 to about 70 weight percent of a glycoside surfactant and from about 30 to about 95 weight percent of an anionic surfactant;

b. from about 1 to about 50 parts by weight of a normally solid water soluble or water dispersible addition polymer selected from the group consisting of styrene/maleic anhydride copolymers and neutralized or partially esterified derivatives thereof; and

c. from about 50 to about 98 parts by weight of water.

4,678,596

RINSE AID FORMULATION

Jean Dupre, Levittown, and Andrea C. Keenan, Plymouth Meeting, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 1, 1986, Ser. No. 858,614
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—174.24 4 Claims

1. A stable aqueous rinse aid dispersion comprising from about 0.5 to about 20 weight percent poly(meth)acrylic acid polymer having a weight average molecular weight ranging from greater than 1000 to less than about 50,000, from about 5 to about 60 weight percent nonionic surfactant, from about 0.3 to about 5.0 weight percent of a substantially alkali neutralized compatibilizer polymer formed from about 25 to about 70 weight percent methacrylic acid and from about 75 to about 30 weight percent of one or more copolymerizable lower alkyl acrylates or methacrylates and having a weight average molecular weight of at least about 500,000, and the balance being water.

4,678,597

CHEMICAL CLEANING SOLUTION AND METHOD

Michael A. Kiener, Deaville, N.J., assignor to AM International, Inc., Chicago, Ill.

Filed Mar. 17, 1986, Ser. No. 840,182
Int. Cl.[4] C11D *7/54, 7/18*
U.S. Cl. 252—100 28 Claims

1. A chemical cleaning composition for photographic processors, consisting of a solution of:

a hydroxycarboxylic acid and

a peroxymonosulfate compound dissolved in water wherein said hydroxycarboxylic acid comprises between about 20 weight percent and 75 weight percent of the total weight of said hydroxycarboxylic acid and said peroxymonosulfate compound and said peroxymonosulfate compound is present in a sufficient concentration to dissolve silver deposits in a photographic processor developer tank.

4,678,598

LIQUID SHAMPOO COMPOSITION

Hidekazu Ogino, Funabashi, and Hajime Hirota, Tokyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

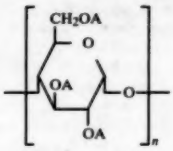
Filed Jul. 30, 1986, Ser. No. 890,547
Claims priority, application Japan, Aug. 6, 1985, 60-172992; Sep. 17, 1985, 60-204981
Int. Cl.[4] C11D *3/22, 17/08*
U.S. Cl. 252—174.17 6 Claims

1. A liquid shampoo composition comprising the following three components (A), (B) and (C):

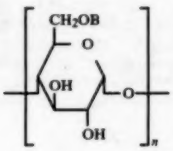
(A) 5 to 30 wt % of at least one surface active agent,

(B) 0.05 to 5 wt % of a skin sensation inducing aromatic chemical selected from the group consisting of menthol, camphor, methyl salicylate, cineol, menthone, piperitone, borneol, beta-pinene, menthyl acetate and varylamide nonylate,

(C) $\frac{1}{4}$ to twenty times by weight based on the amount of component (B) of a modified cyclodextrin represented by the following formula (I) or (II):

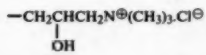


(I)



(II)

in which n represents a number from 6 to 9, A represents a hydrogen atom or a methyl group, and B represents a hydrogen atom or the group (III)



(III)

with the proviso that neither an ether substitution number of methyl group nor a substitution number of group (III) is less than 1.

4,678,599

USE OF COPOLYMERS OF POLYOXYALKYLENE ETHERS OF ALLYL AND/OR METHALLYL ALCOHOL AND VINYL ESTERS AS DEMULSIFIERS FOR WATER-CONTAINING CRUDE OIL

Jürgen Fock, Düsseldorf, and Hans Rott, Essen, both of Fed. Rep. of Germany, assignors to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,029

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338923

Int. Cl.[4] B01D *17/04;* C07C *69/66*

U.S. Cl. 252—343 20 Claims

1. A demulsifier for water-containing crude oil comprising a demulsifying effective amount of one or more copolymers obtained by copolymerizing at least one polyoxyalkylene ether of allyl alcohol or methallyl alcohol with vinyl esters of lower carboxylic acids, or mixtures of vinyl esters of lower carboxylic acids, with up to 50 mole percent of a compound selected from the group consisting of esters of acrylic or methacrylic acid, ethers of allyl or methallyl alcohol with fatty alcohols, wherein the quotient of the average molcular weight of the polyoxyalkylene ethers corresponding to their molar fraction and the number of moles of the compounds to be copolymerized is from 20 to 200.

4,678,600

HEAT EXCHANGE REFORMING PROCESS AND REACTOR

Henrik O. Stahl, Fasanvaenget 514, DK-2980 Kokkedal, and Jens R. Rostrup-Nielsen, Sondervej 74, DK-2830 Virum, both of Denmark

Filed Mar. 19, 1986, Ser. No. 841,251

Claims priority, application Denmark, Mar. 21, 1985, 1266/85

Int. Cl.[4] C01B *3/32*

U.S. Cl. 252—373 5 Claims

1. A process for the steam reforming in a reforming reactor of hydrocarbons by passing a feed stream comprising steam and one or more hydrocarbons as process gas at steam reforming conditions and under external supply of heat through a given volume of steam reforming catalyst to form a product stream rich in hydrogen, said process comprising

(a) passing the process gas through a first portion of the steam reforming catalyst constituting 25–75% thereof, heat needed for the endothermic reactions occurring in the process gas and for heating the process gas being supplied partly from a moderately hot flue gas as defined under (b) and partly from the product stream, and

(b) subsequently passing the process gas partly reformed in step (a) through the remaining portion of the steam reforming catalyst, the heat needed for the further endothermic reactions and heating of the process gas being supplied by a hot flue gas generated by combustion of a fluid fuel, the hot flue gas being hereby cooled to form the moderately hot flue gas employed in step (a).

4,678,601

ELECTROCONDUCTIVE POLYMER-LATEX COMPOSITES

George E. Ham; Wuu-Nan Chen, and John M. McIntyre, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 16, 1985, Ser. No. 776,199

Int. Cl.[4] A01B *1/00*

U.S. Cl. 252—500 15 Claims

1. A polymer-latex composite comprising:

(a) a poly-conjugated unsaturated organic polymeric material capable of being doped to provide an organic electroconductive material;

(b) a latex into which the organic polymeric material is dispersed; and

(c) a dopant in an amount sufficient to make the organic polymeric material electroconductive.

4,678,602

HIGHLY CONDUCTIVE STYRENIC RESIN COMPOSITION

Kazunobu Tanaka, and Kyozo Mori, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed May 14, 1984, Ser. No. 609,946

Claims priority, application Japan, May 16, 1983, 58-85211

Int. Cl.[4] C07C *143/02, 143/16*

U.S. Cl. 252—513 9 Claims

1. An electrically conductive, thermoplastic resin composition consisting essentially of a blend of (A) a copolymer consisting essentially of (1) units of vinyl aromatic monomer, (2) from 2 to 35% by weight, based on the weight of (A), of units of an unsaturated dicarboxylic acid anhydride monomer which is copolymerizable with said vinyl aromatic monomer, and (3) an elastomer, said copolymer (A) containing at least 50% by weight of said vinyl aromatic monomer (1), based on the sum of the weights of (1) and (3), and (B) particles of a metallic filler effective to impart electrical conductivity to said resin composition, said resin composition having been prepared by melt blending said copolymer (A) and said particles (B) in an extruder.

4,678,603

COLOGNE COMPOSITION

Hiroshi Ishii, Yokohama, and Bunichiro Hosoda, Tokyo, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1986, Ser. No. 836,502

Int. Cl.[4] A61K *7/46;* C11B *9/00*

U.S. Cl. 252—522 R 3 Claims

1. A cologne composition comprising 10 to 35% by weight of refined grape wine having pH of 5 to 6 which is obtained by treating unrefined grape wine with 10 to 25 grams of calcium carbonate per one liter of said unrefined grape wine.

4,678,604

2-(1'-HYDROXYIMINO-ETHYL)-1,3,3,4,4-PENTAMETHYLCYCLOPENTENE AND FRAGRANCE COMPOSITIONS CONTAINING SAME

Roman Kaiser, Uster, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Aug. 26, 1986, Ser. No. 900,555

Claims priority, application Switzerland, Sep. 13, 1985, 3974/85

Int. Cl.[4] C11B *9/00*

U.S. Cl. 252—522 R 10 Claims

1. 2(1'-Hydroxyimino-ethyl)-1,3,3,4,4-pentamethylcyclopentene.

4,678,605

CATIONIC SURFACTANTS BASED ON QUATERNARY AMMONIUM COMPOUNDS AND METHODS OF USING SAME

Juergen Geke, Dusseldorf, and Horst Rutzen, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 820,281

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501775

Int. Cl.[4] C11D *1/62*

U.S. Cl. 252—547 9 Claims

1. A cleaning composition for metal surfaces comprising at least one surfactant, a diluent, and a quaternary ammonium cationic compound in at least an amount effective to de-emulsify with respect to anionic contamination, impart an anticorrosive effect, impart a defoaming effect, impart hydrophobic properties to a cleaned surface, impart antistatic properties to a

cleaned surface, or a combination thereof, said compound having the formula:

$$R^1—CHOCH—CHR^2—N^+R^3R^4R^5\ R^6CO_2^-$$

wherein

R^1 is a linear or branched alkyl residue having from 1 to 22 carbon atoms;

R^2 is hydrogen or a linear or branched alkyl residue having from 1 to 21 carbon atoms, the total number of carbon atoms of both the substitutents R^1 and R^2 being in the range of from 8 to 22;

R^3 and R^4 each represent methyl, ethyl, 2-hydroxyethyl or 2-hydroxypropyl;

R^5 represents an alkyl residue having from 4 to 6 carbon atoms or a phenalkyl residue having from 1 to 3 carbon atoms in the alkyl residue; and

R^6 represents a linear or branched alkyl residue having from 4 to 15 carbon atoms.

4,678,606

LIQUID CLEANSING COMPOSITION

Lalarukh Akhter, Newcastle upon Tyne; Ronald E. Atkinson, Hexham, both of England; Dwight E. Wages, Wilbraham, Mass., and Harold H. Beyer, Montgomery, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 749,065, Jun. 26, 1985, abandoned. This application Oct. 24, 1985, Ser. No. 790,717

Claims priority, application United Kingdom, Jul. 3, 1984, 8416884

Int. Cl.[4] C11D *1/83, 3/37*

U.S. Cl. 252—542 **19 Claims**

1. An aqueous, liquid personal cleansing composition consisting essentially of:

(a) from about 8% to about 50% of primary surfactant selected from the group consisting of anionic, cationic, zwitterionic, amphoteric and semi-polar surfactants and mixtures thereof,

(b) from about 0.1% to about 6% of auxiliary surfactant selected from ethoxylated aliphatic alcohols having an average alkyl chain length of from 6 to 13 carbon atoms,

(c) from about 0.1% to about 2% of a water-soluble polymeric thickening agent; wherein the thickening agent is selected from the group consisting of nonionic: guar gum, hydroxypropyl guar gum, methyl cellulose, methyl hydroxypropyl cellulose, hydroxypropyl cellulose, locust bean gum, starch, starch amylose, hydroxyethylamylose and polyoxyethylene; and cationic; hydroxypropyltrimethylammonium guar gums, quaternized cellulose ethers, homopolymers of dimethyl diallyl ammonium chloride, co-polymers of dimethyl diallyl ammonium chloride and acrylamide, quaternized vinyl pyrrolidone acrylate or methacrylate copolymers of amino alcohol, and polyalkylene imines, and mixtures thereof; and

(d) from about 0.1% to about 10% of polyoxy(C_2–C_3)alkyleneglycol having an average molecular weight in the range from about 200 to about 15,000.

4,678,607

ETHYLENE COPOLYMERS WITH ENHANCED FIRE RESISTANT PROPERTIES

Robert R. Reitz, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1986, Ser. No. 889,470

Int. Cl.[4] C09K *21/02, 21/10;* **C09D** *5/18*

U.S. Cl. 252—609 **3 Claims**

1. A flame retardant composition comprising

(a) a matrix comprising 10–40 percent by weight of at least one ethylene copolymer,

(b) 35–89 percent by weight of compositions (a), (b), and (c) of a mixture of

(i) alumina trihydrate and

(ii) calcium carbonate or calcium-magnesium carbonate or both, said mixtures containing a percent weight ratio of (i) or (ii) of 30/70 to 70/30, and

(c) 1–25 percent by weight of composition of (a), (b), and (c) of a melamine/formaldehyde resin.

4,678,608

CHEMILUMINESCENT COMPOSITION

Charles H. Dugliss, Westchester, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 15, 1985, Ser. No. 723,590

Int. Cl.[4] C09K *11/00;* **A01K** *97/12*

U.S. Cl. 252—700 **16 Claims**

1. A composition intended to be reacted with hydrogen peroxide in the presence of an organic solvent to produce visible chemiluminescent light comprising a solvent solution of (1) an oxalate, (2) a fluorescer and (3) from about 5×10^{-4} to 5×10^{-3} percent, by weight, based on the total weight of the composition, of a soluble perylenedicarboximide dye, the mole ratio of said perylenedicarboximide dye to said fluorescer ranging from about 3.45×10^{-3} to 8.15×10^{-1} to 1.

4,678,609

PROCESS FOR THE PREPARATION OF CORTICOSTEROID-21-PHOSPHORIC ACIDS AND THEIR SALTS AND THE CORTICOSTEROID-21-PHOSPHORIC ACID TRIESTERS

Joachim Engels, Kronber, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

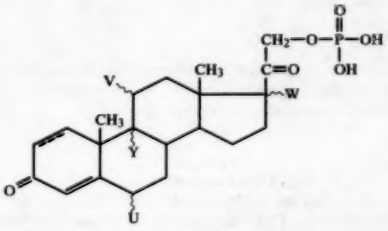
Filed Nov. 6, 1985, Ser. No. 795,542

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440794

Int. Cl.[4] C07J *00/00*

U.S. Cl. 260—397.45 **4 Claims**

1. A process for the preparation of corticosteroid-21-phosphoric acids of the general formula III



III

and of pharmaceutically active salts thereof, in which formula III

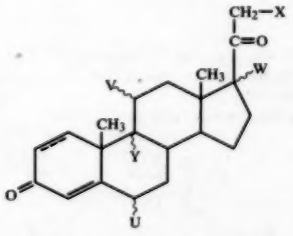
U denotes H or CH_3,

V denotes H, OH, O or halogen,

W denotes H or OH and

Y denotes H or F,

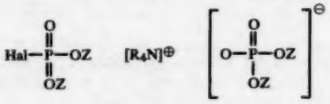
which comprises reacting a corticosteroid of the formula I



I

in which U, V, W and Y have the meaning indicated and X

represents OH or halogen, with an organic phosphoric acid ester of the formula IVa or IVb



IVa IVb

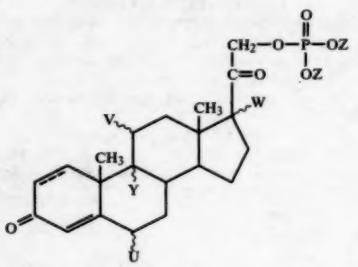
in which

Z is C_{1-8}-alkyl which is unsubstituted or substituted in the α-position by phenyl which in turn is unsubstituted or substituted by Cl, Br, CN or NO_2, alkyl radicals having at least 2 carbon atoms being unsubstituted or monosubstituted in the β-position by CN, nitrophenyl or SO_2—C_{1-4}-alkyl or disubstituted or trisubstituted by Cl and/or Br, and

Hal denotes halogen and

R denotes C_{1-8}-alkyl, but a radical R can also be benzyl and/or hydrogen,

and thus preparing a compound of the formula II



II

in which U, V, W, Y and Z have the meanings mentioned, and saponifying this compound II to give the compound III and, if appropriate, neutralizing the latter to give the salt.

4,678,610

SILICONARYLOZIDES AND SILICONARYLISOCYANATES

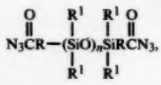
Jonathan D. Rich, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,687

Int. Cl.[4] C07F *7/18, 117/06*

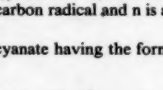
U.S. Cl. 260—349 **4 Claims**

1. Siliconarylazide having the formula,



where R is a $C_{(6-13)}$ divalent arylene radical, R^1 is a $C_{(1-13)}$ monovalent hydrocarbon radical and n is an integer equal to 5 to 2000 inclusive.

2. Siliconarylisocyanate having the formula,



where R is a $C_{(6-13)}$ divalent aromatic arylene radical, R^1 is a $C_{(1-13)}$ monovalent hydrocarbon radical and n is an integer equal to 5 to about 2000 inclusive.

4,678,611

NOVEL DYESTUFF INTERMEDIATES AND USE THEREOF FOR THE MANUFACTURE OF NOVEL AZO DYES

Rudolf Hurter, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

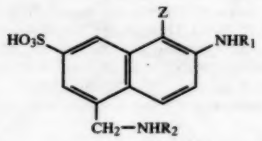
Continuation of Ser. No. 370,227, Apr. 20, 1982, abandoned, which is a division of Ser. No. 217,277, Dec. 16, 1980, Pat. No. 4,360,460, which is a division of Ser. No. 23,514, Mar. 23, 1979, Pat. No. 4,288,363. This application Jan. 17, 1986, Ser. No. 820,751

Claims priority, application Switzerland, Apr. 3, 1978, 3537/78

Int. Cl.[4] C07C *143/56*; C09B *29/00*

U.S. Cl. 260—510 **4 Claims**

1. Dyestuff intermediates of the formula



wherein R_1 represents hydrogen, an alkyl radical of 1 to 8 carbon atoms or a phenyl radical, R_2 represents hydrogen or an acyl radical, and Z represents hydrogen or a sulfo group.

4,678,612

PROCESS FOR THE PRODUCTION OF ARYLSULFONYL HALIDES

Louis F. Bolzan, Briarcliff Manor, and Edward D. Weil, Hastings-on-Hudson, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 31, 1986, Ser. No. 824,741

Int. Cl.[4] C07C *143/70*

U.S. Cl. 260—543 R **10 Claims**

1. A process for the production of arylsulfonyl halides which comprises:

(a) adding to an arylsulfonic acid an effective amount of a phosphorus-containing additive, said additive capable of yielding phosphoric acid under conditions of oxidation or hydrolysis,

(b) reacting the arylsulfonic acid/phosphorus-containing additive mixture of (a) with a sulfur halide and a halogen.

4,678,613

PROCESS FOR THE PURIFICATION OF TRIPHENYLMETHANE COMPOUNDS

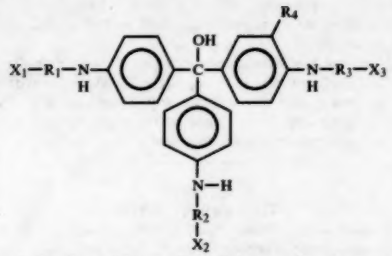
Robert J. Flores, Cincinnati, Ohio, assignor to PMC Specialties Group, Inc., Rocky River, Ohio

Division of Ser. No. 328,899, Dec. 9, 1981, abandoned. This application Dec. 23, 1982, Ser. No. 452,679

Int. Cl.[4] C09B *11/10*

U.S. Cl. 260—391 **30 Claims**

1. A process for purifying crude triphenylmethane compounds having unreacted aromatic amine associated therewith as an impurity or a solvent, wherein the triphenylmethane compound has the following structure:



wherein R_1, R_2 and R_3 are direct linkages, phenyl, or napthyl groups; R_4 is hydrogen or methyl; X_1, X_2 and X_3 are hydrogen, halogen, alkyl of 1 to 4 carbons or alkoxy of 1 to 4 carbons; provided that at least one of R_1, R_2 and R_3 is not a direct linkage and provided that X_1, X_2 or X_3 is hydrogen when the corresponding R_1, R_2 or R_3 is a direct linkage; and wherein said purification process comprises:

(1) heating the triphenylmethane compound in its carbinol form in the presence of aqueous acid at an effective temperature to form the acid salt; and

(2) separating the salt from the aqueous acid solution; and

(3) washing the salt with water to remove water-soluble impurities; and

(4) heating the salt in the presence of an aqueous base at temperatures above about 100° C. and at pressures above atmospheric pressure to produce the triphenylmethane compound in its carbinol form; and

(5) separating the triphenylmethane compound in its carbinol form from the aqueous base solution.

4,678,614

HYDROCARBON-SOLUBLE ORGANOMETALLIC COMPLEXES OF MAGNESIUM AND ALKALI METALS AND METHOD OF PRODUCING SAME

Conrad W. Kamienski, Gastonia, and B. Troy Dover, Kings Mountain, both of N.C., assignors to Lithium Corporation of America, Inc., Bessemer City, N.C.

Filed Nov. 27, 1985, Ser. No. 803,104
Int. Cl.[4] C07F *3/02*
U.S. Cl. 260—665 R **26 Claims**

1. A process for preparing an alkali metal trialkylmagnesiate comprising simultaneously adding to a stirred dispersion of an alkali metal in an inert liquid hydrocarbon solvent a soluble dialkylmagnesium compound and a 2-alkyl substituted C_4–C_{18} primary alkyl halide.

4,678,615

COOLING STACK FOR COOLING TOWERS

Lyuben K. Stambolov, Sofia; Sotir Y. Chaushev, and Dilyan L. Simitchiev, both of Burgas, all of Bulgaria, assignors to DSPIE "D. Blagoev", Kardjali, Bulgaria

Filed Jul. 23, 1986, Ser. No. 888,860
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—111 **4 Claims**

1. A cooling stack for a cooling tower comprising

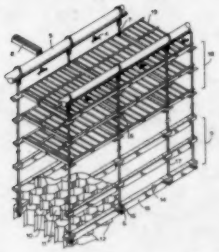
a volumetric polymer block of flow-around type having polyhedron shaped cells,

said block comprising two flow-around layers, each layer comprising a plurality of rows of cellular components,

said components being mounted detachably by means of connecting teeth to connecting seats of carrying bars,

said bars being fastened to connecting strips,

said strips being hung on vertical suspension devices attached to a carrying construction,



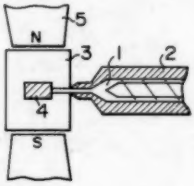
said layers being disposed at a distance from one another vertically by spacing sleeves on said suspension devices.

4,678,616

METHOD OF PRODUCING PERMANENT MAGNET

Giichi Kawashima, Takatsuki, Japan, assignor to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 792,856
Claims priority, application Japan, Nov. 7, 1984, 59-233303
Int. Cl.[4] B29C *35/08*
U.S. Cl. 264—24 **2 Claims**



1. A method of producing a permanent magnet in which a material containing ferromagnetic powder is molded into a columnar or cylindrical molded body through injection molding, compression molding, or the like, in a magnetic field capable of orienting and magnetizing the ferromagnetic powder, said method comprising the steps of:

applying a magnetic field to the molded body in the unidirection perpendicular to an axis of rotation of the molded body to orient and magnetize the molded body so as to have two magnetic poles of N and S;

demagnetizing the magnetized molded body so as to permit divisional remagnetizing of the molded body; and then

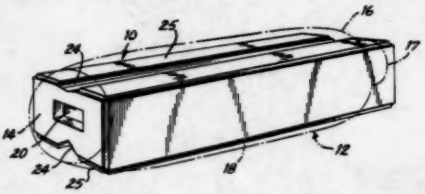
divisionally remagnetizing the demagnetized molded body on its outer or inner surface to form at least two strips of N and S poles arranged alternately and extending parallel to the axis of rotation of the molded body.

4,678,617

METHOD FOR CONVERTING AN EXPENDED THERMOPLASTIC ARTICLE INTO A USEFUL ARTICLE

Donald J. Sykes, Upper Saddle River, N.J., assignor to Marpac Industries, Inc., Waldwick, N.J.

Filed Jun. 28, 1985, Ser. No. 749,818
Int. Cl.[4] H05B 6/00; B29B 17/00; B29C 49/00
U.S. Cl. 264—25 **10 Claims**



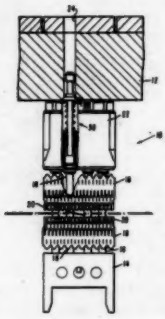
1. Converting an expended, hollow article of thermoplastic material, in the form of an expended container, the article having opposite end walls establishing an original configuration, into a new article, in the form of a building block, having a new configuration, by utilizing the steps of heating the expended article to a temperature above the softening temperature of said material, applying external forming forces inwardly against said article while the temperature of the article remains above said softening temperature, and maintaining an elevated pressure within said article while said forming forces are being applied, to urge said walls outwardly against said forming forces, for effecting conversion from said original configuration to said new configuration.

4,678,618

INDIVIDUAL SOURCE POSITIONING MECHANISM FOR A NUCLEAR REACTOR FUEL ASSEMBLY

John F. Wilson, Murrysville Boro; Robert K. Gjertsen, Monroeville Boro, and Samuel Cerni, Churchill Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 20, 1984, Ser. No. 642,607
Int. Cl.[4] G21C 7/34
U.S. Cl. 376—156 **8 Claims**



1. In a nuclear reactor including a fuel assembly, at least one elongated neutron source rod and an upper core plate, said fuel assembly having top and bottom nozzles with a plurality of guide thimbles extending between and interconnecting said nozzles, said upper core plate being positioned adjacent to and above said top nozzle of said fuel assembly and having a multiplicity of flow openings therethrough to allow passage of coolant from said fuel assembly, at least some of said openings being aligned over respective ones of said guide thimbles with seating means defined about said openings on a lower side of said core plate, a separate mechanism for positioning each individual neutron source rod in a respective guide thimble aligned with one of said openings defined through said upper core plate, comprising:

(a) locating means registering against said core plate seating means; and

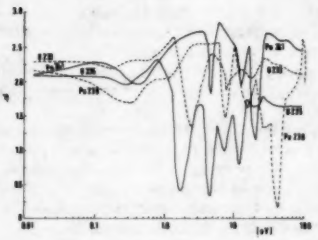
(b) resilient holddown means extending at least partially into said guide thimble and coupling said source rod with said locating means in a manner which restrains said source rod in a lateral direction and positions said rod in a stationary axial relationship within said guide thimble.

4,678,619

NUCLEAR REACTOR

Alvin Radkowsky, Ramat Gan, Israel, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 7, 1979, Ser. No. 37,400
Claims priority, application Fed. Rep. of Germany, May 4, 1978, 2819734
Int. Cl.[4] G21C 1/00, 3/58
U.S. Cl. 376—173 **1 Claim**



1. An epithermal nuclear breeder reactor comprising an active core and means containing a body of pressurized water as a moderator for cooling said core, wherein: said core is composed of a plurality of unit subassemblies each composed of a seed region with moderator to fuel volume ratio of the order of 0.5 and a blanket region with moderator to fuel volume ratio of the order of 0.3, each said region comprising fuel rods of fissile and fertile materials; each said fuel rod in said region is composed of two parts which are configured and movable relative to one another in a manner to vary the number of neutrons leaking from said seed region into said blanket region; said fissile material comprises plutonium having an initial isotope composition such that the ratio of Pu^{241} to Pu^{239} is of the order of 30% and the ratio of Pu^{240} to Pu^{239} is of the order of 40%, said fertile material comprises U^{238}; said seed region contains plutonium in a concentration of 8 to 14%, by weight; and said blanket region contains plutonium in a concentration of 2 to 6%, by weight.

4,678,620

HATCH ASSEMBLY

James R. Marshall, Penn Hills, and Roy T. Hardin, Jr., Greensburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1984, Ser. No. 633,812
Int. Cl.[4] G21C 13/00
U.S. Cl. 376—203 **15 Claims**

14. In a nuclear reactor installation including means defining a fuel handling area and means defining a containment area separated from the fuel handling area and including a refuelling cavity; the improvement comprising

(a) a fuel transfer tube connecting the refuelling cavity with the fuel handling area; said fuel transfer tube having a first end in the fuel handling area and a second end in the refuelling cavity;

(b) valve means for opening and closing said first end; and

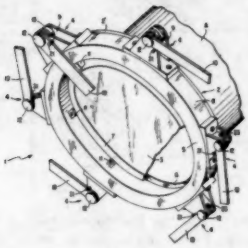
(c) a hatch assembly mounted on said second end; said hatch assembly including

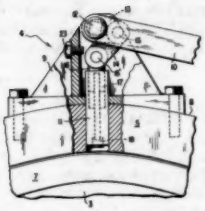
(1) a hatch ring affixed to said fuel transfer tube at said second end thereof; said hatch ring having an integral annular seat surrounded by said hatch ring and defining a hatch opening in said second end of said fuel transfer tube;

(2) a hatch cover adapted to be positioned on said annular seat for covering the hatch opening;

(3) a plurality of latching units supported on said hatch ring about said hatch opening, each said latching unit including

(i) a slidably supported locking bolt movable generally radially inwardly with respect to said annular seat into a hatch cover locking position and generally radially outwardly with respect to said annular seat into a hatch cover releasing position; in said hatch cover locking position at least one length portion of





said locking bolt extending over said hatch cover for maintaining said hatch cover on said annular seat;

(ii) a crankshaft supported for rotation;

(iii) operating means for transmitting a locking torque and an opposite, releasing torque to said crankshaft;

(iv) coupling means for connecting said crankshaft with said locking bolt and for converting rotary motion of said crankshaft to linear motion of said locking bolt, said coupling means including spring means for transmitting the locking torque from said crankshaft as a radially inwardly oriented resilient force to said locking bolt; and

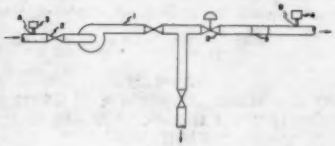
(v) means for resolving the radially inwardly oriented resilient force to a component force in said hatch cover locking position and for transmitting said component force from said locking bolt to said hatch cover for pressing said hatch cover against said annular seat.

4,678,621

METHOD AND MEANS FOR MONITORING THE CONTINUITY OF A FLUID-FILLED NETWORK OF CONDUITS AND VALVES

Vincent M. Callaghan, West Granby, and Melvin J. Wolpert, III, Weatogue, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 29, 1984, Ser. No. 594,964
Int. Cl.[4] G21C *17/00*; F16K *37/00*
U.S. Cl. 376—245 **6 Claims**



1. A system for monitoring the continuity of a network of fluid-filled conduits and valves, including,

a network of conduits and valves which function as a unit to perform a task in a larger system,

a first pressure transducer connected to the network at a predetermined location to emit an acoustic signal of predetermined amplitude and frequency and time sequence and transmit said signal into and through the fluid of the network,

a second pressure transducer connected to the network at a predetermined location remote from the first pressure transducer which receives said signal from said fluid and responds to the acoustic signal from the first pressure transducer,

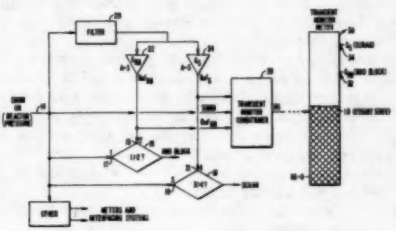
means for comparing the amplitude and frequency and time sequence of the acoustic signal received at the second pressure transducer with the signal transmitted by the first pressure transducer and thereby determine any variation in the amplitude and frequency and time sequence in the transmitted acoustic signal as a guide to locating a change in the network which causes the variation in the signal received.

4,678,622

TRANSIENT MONITOR FOR NUCLEAR REACTOR

William S. Rowe, and Fred C. Chao, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 20, 1985, Ser. No. 767,551
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—259 **18 Claims**



14. The apparatus for monitoring neutron density in a nuclear reactor comprising:

a startup range neutron density monitor;

a first comparator having two inputs and a binary output to initiate rod withdrawal blockage;

a second comparator having two inputs and a binary output to initiate plant SCRAM;

the output of said startup neutron monitor being input to each of said comparators at one input thereof;

a filter for having a preselected time constant for processing the monitored neutron range density;

a first amplifier;

said filter passing its output to said first amplifier having an amplification level to the other input of said first comparator to initiate rod block when said directly monitored signal exceeds said filtered signal;

a second amplifier;

said filter having a second output to said second amplifier for initiating plant SCRAM when said directly monitored output exceeds said filtered and amplified input to said comparator.

4,678,623

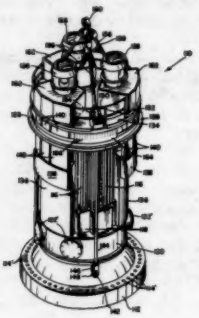
MODULAR HEAD ASSEMBLY AND METHOD OF RETROFITTING EXISTING NUCLEAR REACTOR FACILITIES

Louis J. Malandra, Elizabeth Township, Allegheny County, Pa.; Robert J. Leduc, Columbia, Md.; Michael F. Hankinson, Monroeville, and Edward F. Kowalski, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 3, 1984, Ser. No. 576,676

Int. Cl.[4] G21C *19/00, 1/01*

U.S. Cl. 376—260 **18 Claims**



1. A method of retrofitting existing nuclear reactor facilities so as to form a modular closure head assembly for a nuclear reactor pressure vessel, wherein said existing nuclear reactor facilities comprise control rod drive mechanism cooling systems which include vertically extending elbow air ducts interconnecting vertically spaced upper and lower air manifolds, wherein said elbow air ducts extend radially beyond the peripheral envelope of said closure head, comprising the steps of:

removing said upper air manifold;

removing said vertically extending elbow air ducts;

capping the air ports of said lower air manifold which ports were previously fluidically connecting said lower air manifold to said vertically extending elbow air ducts;

disposing vertically upwardly extending air exhaust ducts above said lower air manifold in such a manner that said air exhaust ducts are disposed within said peripheral envelope of said closure head;

fluidically connecting exhaust fans to the upper regions of said air exhaust ducts;

fluidically connecting said lower regions of said air exhaust ducts to said lower air manifold;

permanently securing lift rods to said closure head at positions disposed radially outwardly of said lower air manifold;

attaching a seismic support platform to said lift rods;

providing fluidic passage of said vertically extending air exhaust ducts through said seismic support platform;

attaching a missile shield plate to said lift rods; and

providing fluidic passage of said vertically extending air exhaust ducts through said missile shield plate.

4,678,624

METHOD FOR LOADING FUEL RODS INTO A CONTAINER

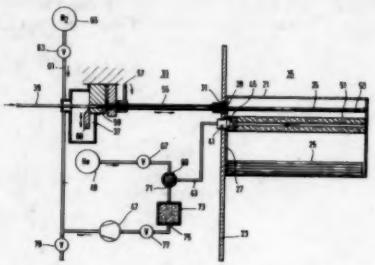
Helfrid Lahr, Karlsdorf, and Bernd Pontani, Alzenau, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 767,180, Aug. 19, 1985. This application Jul. 1, 1986, Ser. No. 881,007

Claims priority, application France, Aug. 17, 1984, 3430244

Int. Cl.[4] G21C *19/00;* **G21F** *5/00*

U.S. Cl. 376—261 **5 Claims**



1. Method of loading a container with individual fuel rods separated from an irradiated nuclear reactor fuel element, the container having an end wall with an opening formed therein close to the inner periphery thereof, the method comprising:

positioning said container in a horizontal position so that said opening is above the lower inner wall surface of said container;

feeding said fuel rods into said container through said opening in a substantially horizontal direction; and,

dropping said fuel rods inside said container so as to cause the same to fall down toward said lower inner wall surface thereby causing said fuel rods to pile up inside said container.

4,678,625

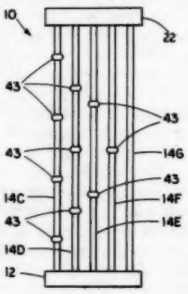
METHOD OF STRAIGHTENING BOWED IRRADIATED FUEL ASSEMBLIES

John F. Wilson, Murrysville Boro, and Robert K. Gjertsen, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 5, 1985, Ser. No. 762,745

Int. Cl.[4] G21C *19/00, 3/32*

U.S. Cl. 376—261 **11 Claims**



1. A method of straightening a fuel assembly having at least

a pair of tubular structural members in which at least one member is bowed and thus greater in length than the other of said members so as to cause said fuel assembly to have a bowed configuration, said straightening method comprising the steps of:

(a) determining the length adjustment required for shortening said bowed tubular structural member in order to make its length generally the same as said other member; and

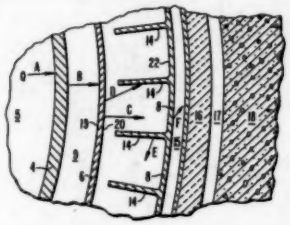
(b) forming at least one circumferential expansion bulge in said bowed member so as to shorten its length by the amount of said length adjustment.

4,678,626

RADIANT VESSEL AUXILIARY COOLING SYSTEM

John H. Germer, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Dec. 2, 1985, Ser. No. 803,353
Int. Cl.[4] G21C *15/18*
U.S. Cl. 376—298 5 Claims



1. An improved radiant vessel passive cooling system for liquid-metal poor-type modular nuclear reactors having a reactor vessel and a surrounding containment vessel spaced apart from said reactor vessel to form a first interstitial region containing an inert gas, the improvement comprising:

a shell spaced apart from and surrounding said containment vessel to form a second interstitial region comprising a circulatory air passage, said circulatory air passage having an air inlet at a first position and an air outlet at a second position which is vertically higher than said first position, said second interstitial region lying between said shell and said containment vessel; and

surface area extension means in said shell longitudinally disposed from said shell into said second interstitial region towards said containment vessel to receive thermal radiation from said containment vessel, said surface area extension means spaced apart from the external surface of said containment vessel whereby heat radiated from said containment vessel is received at said surface extension means for convection, conduction and radiation to air in said circulatory passage.

5. An improved passive cooling system for sodium or sodium-potassium cooled pool-type modular nuclear reactors having a primary vessel and a surrounding secondary containment vessel spaced apart from said primary vessel to form a first interstitial region impregnated with an inert gas; the improvement comprising:

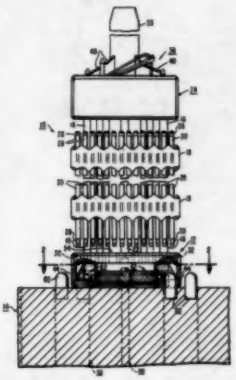
a shell spaced apart from and surrounding said containment vessel to form a second interstitial region between said containment vessel and said shell, said shell further comprising an air inlet at a first position and an air outlet at a second position which is vertically higher than said first position; and longitudinal, radially and inwardly extending fins spaced along the interior surface of said shell to project into said second interstitial region towards said containment vessel to form an extended surface for receiving radiation from said containment vessel whereby heat radiated from said containment vessel is received at said longitudinal, radial and inwardly extending fins for convection, conduction, and radiation to air in said second interstitial region.

4,678,627

DEBRIS-RETAINING TRAP FOR A FUEL ASSEMBLY

John A. Rylatt, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 4, 1985, Ser. No. 720,109
Int. Cl.[4] G21C *19/42*
U.S. Cl. 376—313 22 Claims



1. In a fuel assembly for a nuclear reactor including a plurality of nuclear fuel rods, at least one grid supporting said fuel rods in an organized array, an end flowing through said end nozzle and into said fuel assembly, a trap for capturing and retaining debris carried by said flowing coolant to prevent entry of debris into said fuel assembly, said debris trap comprising:

(a) a hollow enclosure disposed adjacent said end nozzle on an opposite side thereof from said grid, said enclosure being composed of a material which is permeable to the liquid coolant but impermeable to debris carried by the coolant;

(b) said hollow enclosure having upper and lower walls spaced apart and interconnected at their peripheries so as to extend across the direction of liquid coolant flow through said end nozzle and define a debris capturing and retaining chamber within said enclosure;

(c) means on said hollow enclosure defining at least one opening into said chamber of said enclosure through said lower wall, said opening being of a size sufficient to allow passage of debris into said chamber which could not otherwise pass through said material of said hollow enclosure, said opening also being disposed in a predetermined positional relationship with respect to the direction of coolant flow such that debris carried by said liquid coolant flow will enter said chamber of said enclosure through said opening;

(d) lower debris-retaining means located within said chamber of said hollow enclosure and surrounding said opening into said chamber, said lower debris-retaining means having a configuration which serves to retain debris carried by coolant into said chamber through said opening from exiting through said opening; and

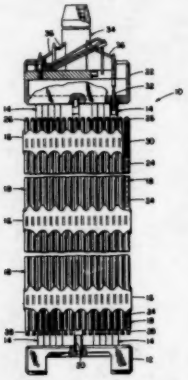
(e) upper flow-diffusing means located within said chamber of said hollow enclosure and being spaced generally above and aligned with said lower debris-retaining means and said opening, said upper flow-diffusing means having a configuration which substantially uniformly distributes across the bottom nozzle the flow of coolant into said chamber through said opening.

4,678,628

NUCLEAR REACTOR CONTROL ROD CLUSTER FOR ENTHALPY RISE COMPENSATION

Thomas R. Freeman, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 3, 1986, Ser. No. 835,672
Int. Cl.[4] G21C 7/10
U.S. Cl. 376—333 7 Claims



1. A control arrangement for use with a nuclear fuel assembly having a plurality of guide thimbles to provide enthalpy rise compensation, comprising:

(a) a spider assembly; and

(b) a plurality of control rodlets containing neutron absorber material, being supported at their upper ends from said spider assembly in a pattern which matches that of said guide thimbles and extending generally parallel to one another downwardly therefrom for insertion into said guide thimbles of said fuel assembly;

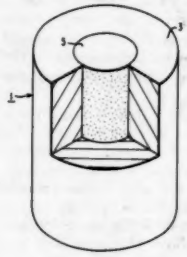
(c) said control rodlets being arranged in a cluster having a higher axial neutron absorption capability at an upper portion than at a lower portion thereof; said each control rodlet varying in axial neutron absorption capability from every other rodlet.

4,678,629

NUCLEAR FUEL PELLET CONTAINING GADOLINIA

Frank D. Popa, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 5, 1985, Ser. No. 772,826
Int. Cl.[4] G21C 3/00
U.S. Cl. 376—419 10 Claims



1. A nuclear fuel pellet comprising:

an annular outer pellet;

a cylindrical inner pellet;

said cylindrical inner pellet located inside of said outer pellet;

said annular outer pellet consisting essentially of UO_2 enriched in U-235;

said cylindrical inner pellet consisting essentially of about 4 to about 18 w/o Gd_2O_3 with the remainder consisting essentially of UO_2 containing uranium selected only from the group consisting of natural uranium, depleted uranium and their mixtures with each other;

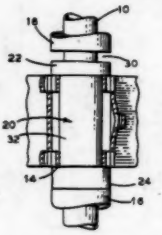
and said cylindrical inner pellet forming between 10 and 50 w/o of said nuclear fuel pellet.

4,678,630

SPACER GRID INSERT

Raymond A. King, Lynchburg; Jeffrey G. Larson, Rustburg, and Lewis A. Walton, Forest, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 520,022, Aug. 3, 1983, abandoned. This application Nov. 15, 1985, Ser. No. 798,148
Int. Cl.[4] G21C 3/32
U.S. Cl. 376—438 2 Claims



1. An improved floating spacer grid in combination with a nuclear fuel assembly of the type having a plurality of parallel fuel rods and at least one guide tube maintained in a laterally spaced array by axially spaced spacer grids, the fuel rods and guide tube extending through the spacer grids, the guide tube having a uniform circular outer surface, the spacer grids being movably mounted to the guide tube to permit axial displacement of the spacer grids relative the guide tube, saddles formed from and within the spacer grids at top and bottom edges of the grids, a spacer sleeve positioned concentrically about the guide tube intermediate the adjacent ones of the axially-spaced spacer grids for limiting axial displacement of the spacer grids, and the spacer sleeve having opposite ends closely spaced from the edges of the adjacent spacer grids to define a displacement space therebetween, the improvement comprising, in combination therewith, a plurality of tubular inserts, each insert mounted to the guide tube within each of the spacer grids, each insert including a tubular portion positioned by the saddles to circumscribe the guide tube within the spacer grid and a circular flange portion at one end of the tubular portion, the flange portion being positioned in the displacement space and abutted to the edge of the spacer grid on the saddles, intermediate the spacer grid and spacer sleeve, and the circular flange portion having substantially the same outer diameter as the spacer sleeve thus precluding direct contact of the spacer sleeve with the spacer grid, and whereby the inserts carry all axial through-grid loads and prevent a horizontal vector force component applied against said grids.

4,678,631

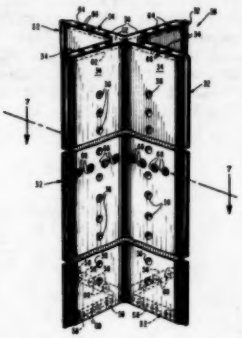
BOILING WATER NUCLEAR REACTOR FUEL ASSEMBLY

Rusi P. Taleyarkhan, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 2, 1985, Ser. No. 729,602
Int. Cl.[4] G21C 3/32
U.S. Cl. 376—444 16 Claims

1. In a fuel assembly having a plurality of elongated fuel rods disposed in side-by-side relationship so as to form an array of

spaced fuel rods, an outer tubular flow channel surrounding said fuel rods so as to direct flow of coolant/moderator fluid along said fuel rods, and a hollow water cross extending through said outer flow channel and having a plurality of hollow panels extending radially from a central axis thereof, said panels being composed of respective pairs of spaced apart sheet members interconnected together at their inner and outer ends so as to define an open inner cruciform flow channel for subcooled moderator fluid flow through said fuel assembly and interconnected with said outer tubular flow channel so as to



divide said array of fuel rods into a plurality of fuel rod subassemblies, said respective pairs of sheet members having bottom and top ends which together respectively define an open inlet into and an open outlet from said inner flow channel of said water cross, the improvement which comprises:

partial closure means connected with said bottom and top ends of said sheet members of said water cross so as to limit said top outlet to an open area less than the open area of said bottom inlet so as to distribute hydraulic losses between said inlet and outlet of said water cross.

4,678,632

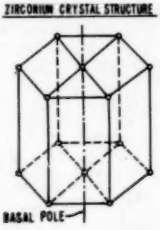
NUCLEAR FUEL ASSEMBLY GRID WITH PREDETERMINED GRAIN ORIENTATION

Harry M. Ferrari, Edgewood Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 741,425, Jun. 5, 1985. This application Oct. 15, 1985, Ser. No. 786,986

Int. Cl.⁴ G21C *3/34*

U.S. Cl. 376—462 **9 Claims**



1. In a fuel assembly support grid including interleaved straps fabricated from fully recrystallized material which upon irradiation grows differently in different directions depending on the texture of the material and defining a multiplicity of cells, each cell adapted to receive a fuel rod therethrough in a direction generally along an axis of said cell and to exert a predetermined spring force on said fuel rod in a direction along a cross-section of said cell which is sufficient for holding the said fuel rod in a predetermined position, the improvement which comprises:

said fully recrystallized material of said grid straps having respective predetermined "f-factor" values in said direction along said cross-section of said grid cell and in said direction along said axis of said grid cell such that upon irradiation of said grid any stess relaxation thereof in said direction along said axis of each of said grid cells will be substantially offset by shrinkage of said grid strap material in said direction along said cross-section of each of said grid cells and thereby maintain said predetermined spring force on each of said fuel rods.

4,678,633

PROCESS FOR FORMING A SINTERED LAYER ON A SUBSTRATE OF IRON-BASED MATERIAL

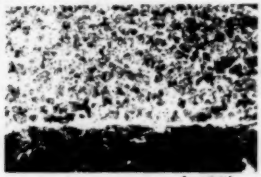
Sigemi Osaki; Norio Yousina; Tsuyoshi Morishita, all of Hiroshima, and Yasuhumi Kawado, Iwakuni, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 11, 1985, Ser. No. 786,804

Claims priority, application Japan, Oct. 15, 1984, 59-215594; Oct. 15, 1984, 59-215595; Oct. 15, 1984, 59-215596

Int. Cl.⁴ B22F *7/00*

U.S. Cl. 419—8 **6 Claims**



(x100)

1. A process for forming a sintered layer on a substrate of iron-based, carbon-containing material, including steps of providing a sheet of powders of an Fe-M-C type alloy, M being at least one of Mo, Cr, B and P, applying said sheet on said substrate and heating said sheet to a sintering temperature to produce a sintered layer by said sheet, said sintered layer containing a carbide produced in the heating step, the alloy powders in said sheet producing a liquid phase during the heating step so that the sintered layer is firmly fitted to the substrate, the improvement comprising a step of providing a lamina beneath the sheet prior to the heating step, said lamina being formed by injecting active beams to a surface of the substrate to convert carbon into a carbide and able to suppress diffusion of carbon from said substrate to said sheet during the heating step.

4,678,634

METHOD FOR THE PREPARATION OF AN ANISOTROPIC SINTERED PERMANENT MAGNET

Yoshio Tawara, and Ken Ohashi, both of Fukui, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1986, Ser. No. 851,529

Claims priority, application Japan, Apr. 18, 1985, 60-83524; Apr. 18, 1985, 60-83525

Int. Cl.⁴ B22F *1/00*

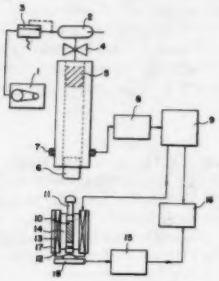
U.S. Cl. 419—30 **10 Claims**

1. A method for the preparation of an anisotropic permanent magnet by a powder of metallurgical technique which comprises the steps of:

(a) applying a magnetic field to a mass of anisotropically magnetic particles in a pulse-wise manner so as to orient the particles to have the easy magnetization axes thereof aligned in the direction of the magnetic field;

(b) applying an impacting compressive force to the mass of the thus oriented anisotropically magnetic particles in the direction substantially parallel to the direction of the

pulse-wise magnetic field, the impacting compressive force being started and ended during the period in which



the pulse-wise magnetic field is sustained, so as to compact the particles into a shaped green body; and

(c) heating the green body into a sintered body.

4,678,635

METALLIC JOINING MATERIAL

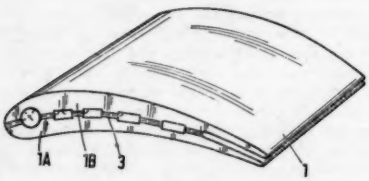
Bernd Jahnke, Neckargemuend, Fed. Rep. of Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Dec. 17, 1985, Ser. No. 810,312

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446479

Int. Cl.⁴ C22C *19/05*

U.S. Cl. 420—449 **1 Claim**



1. Metallic joining material suitable particularly for joining parts made of an oxide-dispersion-hardened alloy, said metallic joining material consisting essentially of 20% by weight chromium, between 1 and 30 % by weight cobalt, 1.5% by weight boron, 4% by weight silicon, 4% by weight W or Mo or Ta, 1% by weight iron, 0.1% by weight nitrogen, 0.4% by weight oxygen, 0.015% by weight carbon, between 5 and 7% by weight aluminum, 1% by weight titanium, 0.5% by weight zirconium and nickel as the balance of the alloy.

4,678,636

DUCTILE BRAZING ALLOY CONTAINING REACTIVE METALS PRECIOUS METALS

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 672,057, Nov. 16, 1984, Pat. No. 4,604,328, which is a continuation of Ser. No. 422,625, Sep. 24, 1982, abandoned. This application Jan. 31, 1986, Ser. No. 835,838

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.⁴ C22C *5/02, 9/00, 19/03, 30/00*

U.S. Cl. 420—456 **4 Claims**

1. A brazing alloy consisting essentially of from about 0.25% to about 5% by weight of a reactive metal selected from the group consisting of titanium, vanadium, zirconium and mixtures thereof, from about 25% by weight to about 85% by weight of a gold-palladium mixture and from about 15% by weight to about 70% by weight of a third metal selected from the group consisting of copper, nickel and mixtures thereof.

4,678,637

COPPER-CHROMIUM-TITANIUM-SILICON ALLOY AND APPLICATION THEREOF

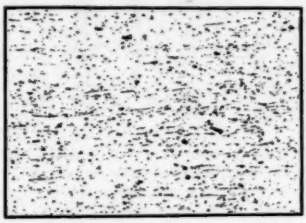
Wolfgang Duerrschnabel, Bellenberg; Franz Puckert, Illerrieden; Heinrich Stueer, Voehringen, and Max Bletschacher, Voehringen-Illerberg, all of Fed. Rep. of Germany, assignors to Weiland-Werke AG, Ulm, Fed. Rep. of Germany

Filed Jul. 9, 1986, Ser. No. 883,871

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527341

Int. Cl.⁴ C22C *9/00*

U.S. Cl. 420—490 **4 Claims**



1. Copper-chromium-titanium-silicon alloy, consisting essentially of 0.1 to 0.5% chromium, 0.05 to 0.5% titanium, 0.01 to 0.1% silicon, and the remainder being copper and usual impurities.

4,678,638

HIGHLY BRANCHED AMINO HEXAHYDROPYRIDINES

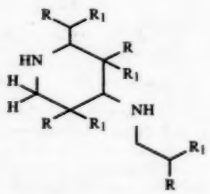
Benjamin T. Outlaw, Webster Groves, and Bernardus A. Oude Alink, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 758,196, Jul. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 239,075, Feb. 27, 1981, abandoned. This application Apr. 28, 1986, Ser. No. 856,267

Int. Cl.⁴ C07D *211/58;* **C23F** *11/06*

U.S. Cl. 422—13 **12 Claims**

1. A compound of the formula



wherein R and R1 are the same or different and independently represent alkyl, phenyl or alkylphenyl.

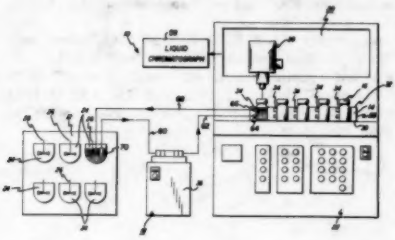
11. Method of inhibiting corrosion of metal which comprises intimately contacting said metal with a corrosion inhibiting amount of a composition comprising a compound of claim 1.

4,678,639

APPARATUS FOR PERIODICALLY MONITORING THE COMPOSITION OF A PLURALITY OF SAMPLES

Michael W. Dong, Norwalk; Stanley K. Yarbro, Newtown, and Frank Vandermark, Shelton, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 2, 1984, Ser. No. 585,797
Int. Cl.[4] G01N *21/05, 33/15, 35/08*
U.S. Cl. 422—81 3 Claims



1. An apparatus for periodically monitoring the composition of a plurality of samples, said apparatus comprising, in combination:

a plurality of sample holders each for holding a sample to be tested;

a plurality of sample flow-through vials, each of said flow-through vials having an inlet and outlet and further including means for enabling the insertion into and withdrawal from each of said flow-through vials of a sample aspirating means;

a plurality of return conduits, each of said return conduits coupling one of said outlets from one of said flow-through vials to one of said sample holders;

a plurality of sample delivering means each of said delivery means including conveying means for causing fluid from one of said sample holders to be delivered into one of said sample flow-through vials, the fluid being returned to the same holders via a return conduit coupled between said one of said flow-through vials and said one of said holders;

means, including sample aspirating means, for selectively withdrawing sample fluid from each of said flow-through vials; and

means for analyzing sample fluid withdrawn by said asperating means whereby said composition of said sample fluid from each of said sample holders is periodically monitored.

4,678,640

INDICATOR FOR DETECTING RESIDUAL ETHYLENE OXIDE

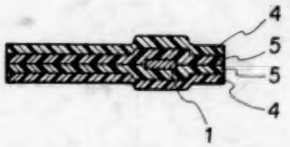
Masanori Hamano, Koshigaya; Siro Takeuchi, Gyoda, and Ichiro Inoue, Hino, all of Japan, assignors to Ekika Carbon Dioxide Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 355,368, Mar. 8, 1982, abandoned. This application Nov. 18, 1985, Ser. No. 799,198
Claims priority, application Japan, Mar. 17, 1981, 56-37318
Int. Cl.[4] G01N *31/22*
U.S. Cl. 422—56 10 Claims

1. An indicator for estimating concentrations of ethylene oxide remaining in medical instruments or sanitary goods during or after aeration following sterilization of said instruments or goods with ethylene oxide comprising:

(a) a substrate formed by impregnating a paper body with a solution consisting of about 0.5-5% by weight of 4-(4-nitrobenzyl)-pyridine in an organic solvent and removing said solvent; and

(b) an envelope enclosing said substrate, said envelope comprising a transparent, heat-sealable single layer or composite plastic film having a low permeability to ethylene oxide and a permeability to carbon dioxide of not more than about 200 ml/100 in ^{2}/mil/24 hours at 25° C. under 1 atmosphere and at 50% relative humidity, said substrate



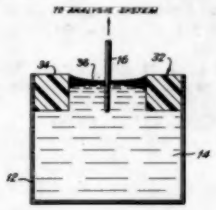
sequentially changing color step-wise following the exposure of the indicator to ethylene oxide gas, with the color change of said substrate during the aeration being controlled by said envelope having a low permeability to ethylene oxide.

4,678,641

ISOLATION LIQUID LAYER RETENTION DEVICE

Michael M. Cassaday, Valhalla, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jun. 30, 1986, Ser. No. 879,918
Int. Cl.[4] B01L *11/00*
U.S. Cl. 422—101 14 Claims



1. In an open container which contains a quantity of a first liquid and a layer of a denser isolation liquid which is generally immiscible with said first liquid and which is disposed atop said first liquid in surface contact therewith, the improvements comprising, an isolation liquid layer retention device operatively associated with said container, said device comprising a porous member which surrounds the surface of said liquid quantity and which contacts said first liquid and said isolation liquid layer to retain said isolation liquid layer in position atop said liquid quantity.

4,678,642

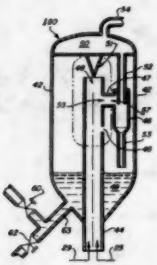
BALLISTIC SEPARATION OF PARTICLES IN A PROGRESSIVE FLOW REACTOR

Donald M. Lee, Huntington, W. Va., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jan. 10, 1985, Ser. No. 690,236
Int. Cl.[4] F27B *15/08*
U.S. Cl. 422—144 16 Claims

1. In an apparatus for the separation of solid particulates suspended in a gaseous medium which comprises: a disengaging chamber serving as a reservoir for the collected solid particulates; a progressive flow reactor having means defining an upstream end and means defining a downstream end which further includes an axial opening wherein at least a portion of said reactor including said downstream end is enclosed within said disengaging chamber; means for effecting the flow of a gas-solid stream from the upstream end of said reactor towards said downstream end; and a take-off conduit in fluid communication with said reactor located at a position proximate said axial opening and which is connectable to a cyclone separator means, wherein the improvement comprises: providing means

defining a vapor pathway within said portion of said flow reactor through which vapors in a dilute phase within said disengaging chamber are induced to enter said reactor because



of a differential in pressure between said reactor and said disengaging chamber, wherein the ratio of the cross-sectional flow area of said pathway to the cross-sectional flow area of said take-off conduit is in the range of about 1:4 to about 1:8.

4,678,643

APPARATUS FOR CATALYTIC CLEANING OF EXHAUST GASES FROM A FURNACE SYSTEM

Wolfgang Fetzer, Heidelberg, Fed. Rep. of Germany, assignor to Svenska Rotor Maskiner Aktiebolag, Stockholm, Sweden

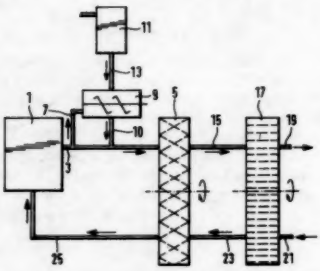
PCT No. PCT/EP85/00063, § 371 Date Aug. 16, 1985, § 102(e) Date Aug. 16, 1985, PCT Pub. No. WO85/03645, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 21, 1985, Ser. No. 769,630

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406657

Int. Cl.[4] B01J *8/10*

U.S. Cl. 422—175 **23 Claims**



1. Apparatus for selectively eliminating oxides of nitrogen in exhaust gases of furnace systems, comprising:

a rotary catalytic converter having catalyst elements disposed in a movable carrier;

exhaust gas connection means for supplying exhaust gases emerging from a furnace system to said catalytic converter in a first direction; chemical feed means and blending means coupled to said exhaust gas connection means upstream of said catalytic converter for introducing and blending at least one chemical compound with said exhaust gas emerging from a furnace system prior to said exhaust gases reaching said catalytic converter;

a cleaning gas connection means coupled to said catalytic converter for introducing at least one cleaning gas flow into said catalytic converter countercurrent to the exhaust gas flow through said catalytic converter;

said catalytic converter having a first zone through which said exhaust gases flow, and a second zone through which said at least one cleaning gas flows; and

rotatable drive means coupled to said carrier for moving said carrier of said catalytic converter relative to said exhaust and cleaning gas connection means such that said carrier is rotatable relative to said exhaust and cleaning gas connection means to thereby vary the location of catalytic converter segments through which the exhaust gases flow and through which the current of cleaning gas flows.

4,678,644

APPARATUS AND METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

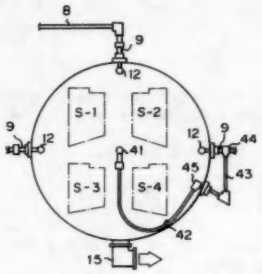
Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 583,207, Feb. 24, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 825,941

Claims priority, application Japan, Feb. 25, 1983, 58-29370; Apr. 13, 1983, 58-63733; Apr. 13, 1983, 58-63734; Apr. 13, 1983, 58-63735; Jun. 28, 1983, 58-115273; Jun. 28, 1983, 58-115274; Jul. 25, 1983, 58-134416

Int. Cl.[4] B01J *19/08*

U.S. Cl. 422—186.05 **9 Claims**



1. An apparatus for plasma-treating works of resin material by irradiating the surfaces of the works with a microwave discharge plasma within a vacuum reaction chamber having an inner wall, comprising at least one first plasma-irradiating pipe fixed to the inner wall of the reaction chamber, said first plasma-irradiating pipe being provided with numerous small holes distributed along the length of said pipes, the distribution of said nozzle holes having a predetermined angular configuration within 7.5° to 45° along the length of said tubular pipes, and at least one second plasma-irradiating pipe formed of flexible material and having a free end, wherein said second plasma-irradiating pipe is movable so that said free end may be adjusted to an optional position within the reaction chamber.

4,678,645

CONVERSION OF LPG HYDROCARBONS TO DISTILLATE FUELS OR LUBES USING INTEGRATION OF LPG DEHYDROGENATION AND MOGDL

Clarence D. Chang; Joe E. Penick, both of Princeton, and Richard F. Socha, Trenton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 650,473, Sep. 14, 1984, Pat. No. 4,542,247. This application May 30, 1985, Ser. No. 739,407

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.[4] B01J *8/04*; C07C *2/12, 2/74*

U.S. Cl. 422—190 **12 Claims**

1. An apparatus for producing distillates or lubes from paraffins, which comprise:

(a) a dehydrogenation reactor including means for passing a paraffinic feedstock stream into a dehydrogenation zone at conditions of pressure and temperature selected to convert the paraffins to an olefin rich effluent stream comprising at least one of the group consisting of propylene and butylene;

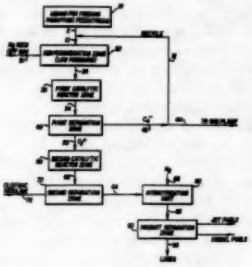
(b) a low pressure oligomerization catalytic reactor including means for contacting said olefin rich effluent stream in

a low pressure oligomerization catalytic reactor zone with a crystalline zeolite oligomerization catalyst at conditions of pressure and temperature selected to convert olefins to a first reactor effluent stream rich in liquid olefinic gasoline range hydrocarbons;

(c) a first means for separating the first reactor effluent stream to form a substantially liquid C_5^+ rich stream and a C_4^- rich stream;

(d) means for passing said C_5^+ rich stream to a high pressure oligomerization catalytic reactor zone;

(e) a high pressure oligomerization catalytic reactor including means for contacting the substantially liquid C_5^+ rich



stream in said high pressure oligomerization catalytic reactor zone with a crystalline zeolite oligomerization catalyst at conditions of temperature and pressure selected to produce a second reactor effluent stream whic his rich in distillate;

(f) second means for separating the second reactor effluent stream to recover an olefinic gasoline stream and a distillate stream; and

(g) a hydrotreating reactor including means for contacting said distillate stream with hydrogen in a hydrotreating unit to produce a hydrotreated distillate stream comprising lube range hydrocarbons.

4,678,646

CRYSTALLIZER

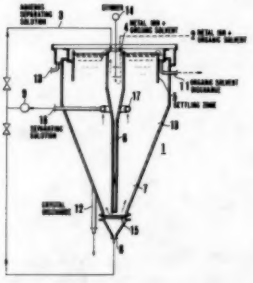
Morio Watanabe, Hyogo; Sanji Nishimura, and Nobuatsu Watanabe, both of Kyoto, all of Japan, assignors to Solex Research Corporation of Japan, Tokyo, Japan

Continuation of Ser. No. 439,785, Nov. 8, 1982, abandoned. This application Dec. 30, 1985, Ser. No. 815,200

Claims priority, application Japan, Nov. 11, 1981, 56-179664

Int. Cl.[4] B01D *9/00, 11/04*

U.S. Cl. 422—245 **3 Claims**



1. A crystallizer for crystallizing metal values from an organic solvent containing ions of the metal values by mixing therewith a stripping solution comprising

a crystallizing tank comprising an upper section and a lower section for precipitating crystals of the metal values from the stripping solution, said lower section reducing in dimension toward the lower end and having an inlet for a recycled stripping solution at the lower end thereof,

a top-opened mixing tank provided in the upper section of the crystallizing tank and having a solution inlet and a downward pipe extending through the crystallizing tank and opening to the lower section of the crystallizing tank, said mixing tank mixing the organic solvent containing the metal ions with the stripping solution to strip the metal ions into the stripping solution and allowing the stripping solution to flow down the downward pipe,

a crystal discharge pipe communicating to the lower section of the crystallizing tank for discharging the crystals precipitated from the stripping solution to the exterior of the crystallizing tank,

a zone for settling the organic solvent stripped off the metal ions overflowing from the mixing tank, provided in the upper portion of the upper section around the mixing tank, a discharge pipe for discharging an overflow from the setting zone to the exterior of the crystallizing tank, and a ring discharge pipe provided through the crystallizing tank at or near the border line between the upper and lower sections for discharging the stripping solution and communicating to a solution circulation system for recycling the stripping solution to both the mixing tank and to the inlet in the lower end of the tank.

4,678,647

PROCESS FOR THE RECOVERY OF GALLIUM AND GERMANIUM FROM COAL FLY ASH

Bohdan Lisowyj, Omaha, Nebr.; David C. Hitchcock, Independence, Mo., and Henry Epstein, Omaha, Nebr., assignors to Enron Corp., Omaha, Nebr.

Filed May 12, 1986, Ser. No. 861,985

Int. Cl.[4] C01G *15/00, 17/00*

U.S. Cl. 423—96 **11 Claims**

1. A method of recovering gallium and germanium from fly ash which comprises:

(a) pelletizing the fly ash, then

(b) heating the pellets in an oxidizing atmosphere at a temperature of from about 900° C. to just below the fusion temperature of the pellets, the temperature being high enough to remove trace elements volatile in an oxidizing atmosphere, then

(c) treating the pellets in a reducing atmosphere at a temperature of from about 900° C. to just below the fushion temperature of the pellets to reduce the gallium and germanium oxides to suboxides and cause them to sublime, and then

recovering the gallium and germanium suboxides from the gas.

4,678,648

METHOD AND APPARATUS FOR SELECTIVE ABSORPTION OF HYDROGEN SULPHIDE FROM GAS STREAMS CONTAINING HYDROGEN SULPHIDE AND CARBON DIOXIDE

Nicholas P. Wynn, Toronto, Canada, assignor to Sulzer Canada, Inc., Toronto, Canada

Filed Feb. 10, 1986, Ser. No. 828,064

Claims priority, application Switzerland, Feb. 22, 1985, 823/85

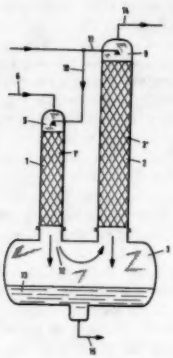
Int. Cl.[4] C01B *17/16, 31/20;* **B01D** *47/00;* **B01F** *3/04*

U.S. Cl. 423—228 **10 Claims**

1. A process for absorbing hydrogen sulphide from, a feed gas containing hydrogen sulphide and carbon dioxide, said process comprising the steps of

contacting the feed gas with a solvent containing an aqueous

solution of alkanolamine in an absorption column containing structured packings each including a plurality of parallel corrugated plates having angularly disposed corrugations disposed in criss-crossing relation to a facing corru-



gated plate whereby the solvent absorbs the hydrogen-sulphide;

collecting the hydrogen-sulphide loaded solvent; and

removing the hydrogen-sulphide depleted gas.

4,678,649

PROCESS FOR THE MANUFACTURE OF MONOPOTASSIUM PHOSPHATE

Iosef Alexander, and Menachem Bar-on, both of Arad, Israel, assignors to Negev Phosphates Ltd., Israel

Filed Jun. 6, 1986, Ser. No. 872,061

Claims priority, application Israel, Jul. 10, 1985, 75767

Int. Cl.[4] C01B *15/16, 25/26*

U.S. Cl. 423—308 **9 Claims**

1. A process for the manufacture of substantially pure monopotassium phosphate without utilizing organic solvents which comprises the steps of:

(a) reacting in at least two stages, at a temperature in the range of between 40 to 100 degrees centigrade monopotassium sulfate with a phosphate constituent selected from the group consisting of phosphate rock, dicalcium phosphate or mixtures thereof in the presence of phosphoric acid and in the absence of free sulfuric acid to form a slurry containing phosphoric acid, monopotassium phosphate and calcium sulfate, and separating out the formed calcium sulfate to obtain a filtrate containing phosphoric acid and monopotassium phosphate, the amount of phosphoric acid being in the range of between 5% and 35% of the total P_2O_5;

(b) neutralizing at a pH in the range of between 3 to 7 the filtrate obtained in step (a) with a calcium-containing compound comprising $Ca(OH)_2$, CaO or $CaCO_3$ or mixtures thereof to obtain a slurry containing dicalcium phosphate, and separating out the dicalcium phosphate; and

(c) crystallizing, from the filtrate obtained in step (b) substantially pure monopotassium phosphate.

4,678,650

PROCESS FOR MAKING AN ALKALI PHOSPHATE SOLUTION

Reinhard Gradl, and Gero Heymer, both of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 715,167

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413020

Int. Cl.[4] C01B *15/16*

U.S. Cl. 423—309 **3 Claims**

1. In the process for making an aqueous alkali phosphate solution wherein an organic phase comprising a solution of phosphoric acid in a solvent immiscible or only partially miscible with water is countercurrently mixed with an aqueous phase containing an alkali compound dissolved therein, the organic phase and aqueous phase being used in a volume ratio larger than 1:1, and the resulting aqueous alkali phosphate solution being separated from the remaining organic phase, the improvement which comprises:

(a) mixing and simultaneously reacting the said two phases fed into at least one reaction zone comprising in each case a mixing zone and separating zone, the upper end of said mixing zone terminating inside or immediately below the separating zone and said mixing zone communicating directly with the separating zone;

(b) continuously dispersing in the aqueous phase the organic phase being in total larger in volume than the aqueous phase by introducing, prior to starting the reaction, an aqueous alkali phosphate solution having the composition desired for the final product into the mixing and separating zones;

(c) maintaining a volume excess of aqueous phase in the mixing zone by introducing feed material into the mixing zone and taking effluent material from the reaction zone in quantities sufficient for the layer separating the two phases from one another to reach considerably beyond the upper end portion of the mixing zone; and

(d) feeding the said two phases into the reaction zone in an overall quantity sufficient to provide a volume ratio of organic phase to aqueous phase of 4:6 to 2:8, in the mixing zone.

4,678,651

PROCESS FOR PREPARATION OF FAUJASITE ZEOLITE

Hiroshi Miyazaki, Shinnanyo; Junji Arika, Tokuyama, and Michiyuki Aimoto, Kudamatsu, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

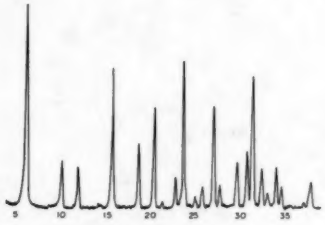
Filed Jul. 11, 1985, Ser. No. 753,998

Claims priority, application Japan, Jul. 11, 1984, 59-142289

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—329 **3 Claims**



1. A process for the preparation of a faujasite zeolite wherein a reaction mixture comprising a silica source, an alumina source and an alkali metal source is crystallized at an elevated temperature, characterized in that a transparent faujasite germ

solution is incorporated in the reaction mixture to be crystallized, and the reaction mixture having the transparent faujasite germ solution incorporated therein is then crystallized with stirring, said transparent faujasite germ solution being obtained by mixing and aging an aqueous solution of an alkali metal silicate, an aqueous solution of an alkali metal aluminate and an aqueous solution of an alkali metal hydroxide and having an oxide molar composition represented by the following oxide molar ratios:

$SiO_2/Al_2O_3 = 8$ to 14,

$M_2O/Al_2O_3 = 7$ to 30,

and

$H_2O/M_2O = 10$ to 14,

wherein M represents an alkali metal, and the amount of said transparent faujasite germ solution being 1% to 30% by weight as Al_2O_3 based on the resulting faujasite zeolite.

4,678,652

PROCESS FOR PRODUCING SILICA IN FINE POWDER FORM

Hiroyuki Tamenori, Kawanishi; Akihiko Hattori, Itami, and Mitsugi Yoshiyagawa, Yokkaichi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Oct. 9, 1985, Ser. No. 785,806

Int. Cl.[4] C01B *33/12*

U.S. Cl. 423—339 **17 Claims**

1. A process for producing silica in powder form, which comprises

(a) adding at least one water-miscible alcohol selected from water-miscible monohydric and dihydric alcohols to an aqueous solution of an alkali metal silicate having an SiO_2 concentration of 9 to 20% by weight until a solid precipitate forms and the solution begins, or is about, to become turbid,

(b) adding a mineral acid to the resulting mixture in an amount 35 to 80% of the stoichiometrical amount required to neutralize the alkali metal silicate to precipitate silica as a fine powder, and

(c) thereafter bringing the resulting slurry into contact with a mineral acid under an acidity of at least 1N.

4,678,653

PROCESS FOR PREPARING CHLORINE DIOXIDE

Maria G. Norell, and Johan C. Wanngård, both of Sundsvall, Sweden, assignors to KemaNord AB, Stockholm, Sweden

Filed Apr. 23, 1985, Ser. No. 726,330

Claims priority, application Sweden, Apr. 1, 1985, 8501615

Int. Cl.[4] C01B *7/01, 11/02, 17/74*

U.S. Cl. 423—478 **3 Claims**

1. A process for production of chlorine dioxide which comprises:

(a) reacting in a chlorine dioxide generator sodium chlorate with chloride ions and sulfuric acid in an acid normality of about 2 to about 4.8 normal, said chloride ions being provided by hydrochloric acid or by a mixture of hydrochloric acid and sodium chloride, in proportions to generate chlorine dioxide,

(b) maintaining said reaction medium at a temperature from about 50° C. to about 100° C.,

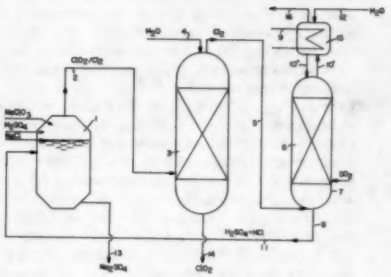
(c) subjecting the reaction solution to a subatmospheric pressure sufficient to effect evaporation of water,

(d) precipitating sodium sulfate from the reaction medium and removing it from the reaction zone,

(e) withdrawing a mixture of chlorine dioxide, chlorine and water vapour and forming an aqueous solution of the chlorine dioxide and a gaseous chlorine stream therefrom,

(f) forwarding at least part of said chlorine to a reactor to exothermically react with sulfur dioxide in the presence of water in order to produce a mixture of hydrochloric acid and sulfuric acid,

(g) removing heat from said exothermic reaction by keeping the reactor at a temperature at or above the boiling point of the mixed acid produced and evaporating 0.15 to 0.35 parts by weight of water based on one part by weight of the produced mixed acid and condensing the vapour withdrawn from the reactor in a condenser,



(h) introducing the condensed phase from the condenser to the top of the reactor,

(i) withdrawing produced mixed acid at the bottom of the reactor and

(j) introducing at least part of the produced mixed acid from step (i) into the chlorine dioxide generator.

4,678,654

PROCESS FOR PRODUCTION OF CHLORINE DIOXIDE

Ulla-Kari M. Holmström, Sundsvall; Lage M. Sandgren, Kvissleby; Maria G. Norell, Sundsvall, and Peter A. Axegård, Solna, all of Sweden, assignors to KemaNord AB, Stockholm, Sweden

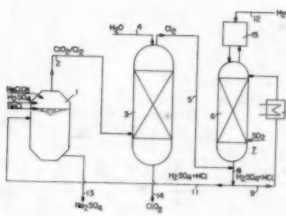
Filed Apr. 23, 1985, Ser. No. 726,327

Claims priority, application Sweden, Mar. 4, 1985, 8501046

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.[4] C01B *7/01, 11/02, 17/74*

U.S. Cl. 423—478 **10 Claims**



1. A process for production of chlorine dioxide which comprises:

(a) reacting in a chlorine dioxide generator sodium chlorate with chloride ions and sulfuric acid in an acid normality of about 2 to about 4.8 normal, said chloride ions being provided by hydrochloric acid or by a mixture of hydrochloric acid and sodium chloride, in proportions to generate chlorine dioxide;

(b) maintaining said reaction medium at a temperature from about 50° C. to about 100° C.;

(c) subjecting the reaction solution to a subatmospheric pressure sufficient to effect evaporation of water;

(d) precipitating sodium sulfate from the reaction medium and removing it from the reaction zone;

(e) withdrawing a mixture of chlorine dioxide, chlorine and water vapour and forming an aqueous solution of the chlorine dioxide and a gaseous chlorine stream therefrom;

(f) forwarding said chlorine to a production zone for hydrochloric acid and sulfuric acid comprising a primary reaction zone and a secondary reaction zone;

(g) introducing sulfur dioxide and chlorine into the lower part of the primary reaction zone in contact with a fluid stream which contains hydrochloric acid and sulfuric acid, at least a portion of said chlorine coming from the secondary reaction zone, whereby said sulfur dioxide reacts with the chlorine in said primary reaction zone to form a fluid mixture of hydrochloric acid and sulfuric acid containing residual sulfur dioxide;

(h) forwarding said fluid mixture of acids, which contains residual sulfur dioxide, from said primary reaction zone, to the secondary reaction zone and introducing chlorine, in an amount sufficient for gaseous chlorine to leave said secondary reaction zone and in an amount exceeding that which stoichiometrically corresponds to the reduction of the sulfur dioxide content in the mixed acid, into the lower part of said secondary reaction zone downstream of the sulfur dioxide feed stream in the primary reaction zone and in contact with said fluid mixture, the chlorine reacting with the sulfur dioxide and thereby reducing the sulfur dioxide content in the mixture of acids flowing through said secondary reaction zone, the chlorine and the sulfur dioxide being introduced into the production zone in substantially stoichiometrically equal amounts; and

(i) forwarding at least part of the mixture of acids passing through said secondary reaction zone to the chlorine dioxide generator, and withdrawing gaseous chlorine from the top of the secondary reaction zone and passing it to the lower portion of the primary reaction zone.

4,678,655

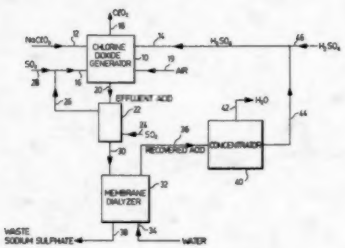
ACID RECOVERY IN CHLORINE DIOXIDE GENERATION

Zbigniew Twardowski, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Aug. 1, 1984, Ser. No. 636,506

Int. Cl.[4] C01B *11/02;* **B01D** *13/00;* **C02F** *1/70*

U.S. Cl. 423—478 **24 Claims**



1. A process for the production of chlorine dioxide, which comprises:

reducing sodium chlorate in an aqueous sulphuric acid-containing reaction medium to which chlorine dioxide-generating reactants are continuously fed,

continuously removing a sulphuric acid- and sodium sulphate-containing aqueous effluent stream from said reaction zone,

continuously effecting preferential sulphuric acid migration from said effluent stream across an anion-exchange membrane to a recipient aqueous medium which has a lesser acid concentration than the effluent stream to the extent of at least about 70% of the sulphuric acid in said effluent stream to form a sulphuric acid stream having a concentration of at least about 3.0 molar H_2SO_4 and simultaneous preferential sodium sulphate retention in the effluent stream, whereby there is recovered from said effluent stream a sulphuric acid stream which can be concentrated to about 65% H_2SO_4 without precipitation of sodium sulphate therefrom,

concentrating said sulphuric acid stream to a concentration of at least about 65% H_2SO_4 without precipitating sodium sulphate therefrom to provide a concentrated sulphuric acid stream suitable for feed as one of said chlorine dioxide-generating reactants to said aqueous reaction medium, and

recycling said concentrated sulphuric acid stream to said aqueous reaction medium.

4,678,656

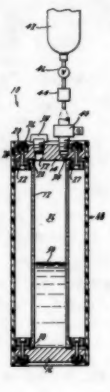
FORMATION OF DENSE CHLORINE HYDRATE

Harry K. Bjorkman, Jr., and Peter Carr, both of Greensboro, N.C., assignors to Energy Development Associates, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 673,223, Nov. 20, 1984, abandoned, which is a continuation of Ser. No. 475,184, Mar. 14, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 752,349

Int. Cl.[4] C01B *7/01;* **H01M** *8/06*

U.S. Cl. 423—500 **12 Claims**



1. A method of forming chlorine hydrate, comprising the steps of:

(a) providing a vessel capable of being sealed off from the ambient environment;

(b) adding a quantity of an aqueous liquid to said vessel;

(c) adding liquid chlorine into said vessel in a quantity such that a portion of the liquid chlorine evaporates until the pressure in said vessel is below 100 psig, but above those chlorine vapor pressures necessary for the formation of chlorine hydrate in the temperature range +6° C. to +20° C., and said pressure is maintained throughout the formation of chlorine hydrate;

(d) sealing the vessel;

(e) allowing the quantity of aqueous liquid to react with the remaining liquid chlorine to form chlorine hydrate; and

(f) removing the heat of hydrate formation to an environment having a temperature of approximately +6° C. up to a room temperature of approximately 26°C.

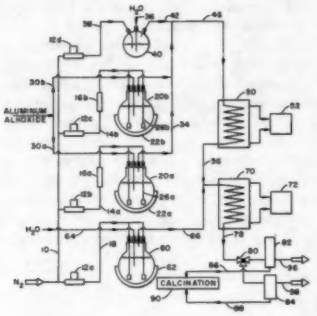
4,678,657
PRODUCTION OF HIGH PURITY SUBSTANTIALLY SPHERICAL METAL HYDROXIDE/OXIDE PARTICLES FROM THE HYDROLYSIS OF A METAL ALKOXIDE AEROSOL USING METAL HYDROXIDE/OXIDE SEED NUCLEI

Ajay Sood, Ross Township, Allegheny County, and Robert A. Marra, Penn Hills, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 10, 1985, Ser. No. 742,770

Int. Cl.[4] C01E *7/02, 7/30, 7/36;* **C01B** *13/14*

U.S. Cl. 423—600 **13 Claims**



1. A process for the production of high purity substantially spherical metal oxide particles using seed nuclei consisting of particles of the same metal, which is in the hydroxide form, as produced by the process without introducing impurities which comprises:

(a) forming a metal alkoxide vapor;

(b) reacting said vapor with a non-reactive gas containing sufficient water vapor to hydrolyze a portion of the metal alkoxide vapor to form solid seed nuclei of metal hydroxide;

(c) cooling the remaining metal alkoxide vapor containing the metal hydroxide seed nuclei sufficiently to form an aerosol comprising finely divided metal alkoxide liquid condensed on said solid metal hydroxide seed nuclei;

(d) hydrolyzing said metal alkoxide aerosol while maintaining said aerosol under a turbulent flow condition, by contact with water vapor to hydrolyze said metal alkoxide liquid on said solid metal hydroxide seed nuclei to form substantially spherical metal hydroxide particles; and

(e) calcining said substantially spherical metal hydroxide particles to form the corresponding metal oxide.

4,678,658
AEROSOL GERMICIDE AND DYE

Irene Casey, Dept. 1013, P.O. Box 90020, Houston, Tex. 77290, and Daniel Tusé, Fremont, Calif., assignors to Larry Casey and Irene Casey, both of Houston, Tex.

Continuation-in-part of Ser. No. 738,082, May 24, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,236

Int. Cl.[4] A61K *9/12, 7/46, 7/50;* **A01N** *25/00*

U.S. Cl. 424—7.1 **7 Claims**

1. A biocide aerosol spray dispensing unit for disinfecting a surface with a fine spray consisting essentially of

a fluid biocide;

a sufficiently airtight container for said fluid biocide;

said fluid biocide including a lower alkyl alcohol having 1 to 4 carbon atoms, an effective amount of a disinfecting surfactant, a pH sensitive dye, and alkali means for adjusting the pH of the fluid to produce a color in the liquid in the dye so that upon neutralization the dye loses color; and

a propellant system to disperse a fine spray of said biocide on the surface to be disinfected.

4,678,659
THERAPEUTIC DEVICES INCORPORATING WATER SOLUBLE GLASS COMPOSITIONS

Cyril F. Drake, Harlow, and John R. Brocklehurst, Bishop's Stortford, both of England, assignors to STC, plc, London, England

Continuation-in-part of Ser. No. 673,273, Nov. 20, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,067

Claims priority, application United Kingdom, Nov. 26, 1983, 8331661

Int. Cl.[4] A61K *9/00;* **A01N** *11/04*

U.S. Cl. 424—451 **7 Claims**

1. A therapeutic device for oral administration to the alimentary tract, the device being readily soluble in that part of the alimentary tract where low pH conditions pertain but which is of low solubility under high pH conditions, the device comprising a sealed capsule of a water soluble glass containing a therapeutic material, wherein said glass comprises phosphorus pentoxide as the glass forming oxide, a first glass modifying oxide (M_2O) selected from the group consisting of alkali metal oxides and mixtures thereof, and a second glass modifying oxide (M'O) selected from the group consisting of alkaline earth metal oxides, zinc oxide, cupric oxide and mixtures thereof, and wherein the glass has a composition selected from the range 25.0 to 40.3 mole % M_2O, 25.0 to 35.0 mole % M'O and 33.5 to 45 mole % P_2O_5, the composition being such that the ratio of the dissolution rates of the glass at pH 2 and at pH 6 is at least 60 to 1, whereby in use, when in contact with a part of the alimentary tract where low pH conditions pertain, rapid dissolution of the capsule is effected to provide release of the therapeutic material as a single dose.

4,678,660
THERMOPLASTIC POLYURETHANE ANTICOAGULANT ALLOY COATING

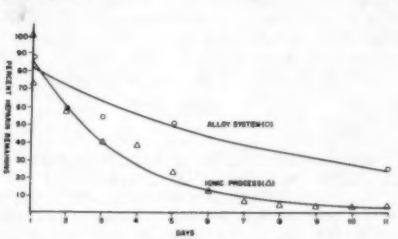
Charles W. McGary, Centerville, and Donald D. Solomon, Spring Valley, both of Ohio, assignors to Deseret Medical, Inc., Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 679,160, Dec. 7, 1984. This application Aug. 14, 1985, Ser. No. 765,612

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[4] C08L *5/10;* **A61K** *31/75*

U.S. Cl. 424—25 **15 Claims**



1. A thermoplastic polyurethane product possessing long-term antithrombogenic and antibiotic properties, comprising

(a) a polyurethane alloy complex formed in a solvent solution;

(b) said polyurethane alloy complex including

(1) a thermoplastic polyurethane;

(2) a material dispersed throughout said thermoplastic polyurethane;

(3) said dispersed material being selected from the group consisting of an antithrombogenic material, an antibiotic material, and mixtures thereof;

(4) said dispersed material ionically bonded to said thermoplastic polyurethane by a quaternary ammonium compound;

(c) a solid polyurethane substrate separate from said thermoplastic polyurethane in said polyurethane alloy complex comprised of a material not soluble in said solvent solution for said polyurethane alloy complex; and

(d) said polyurethane alloy complex being in the form of a surface layer on said separate polyurethane substrate.

4,678,661

EFFERVESCENT COMPOSITION AND METHOD OF MAKING SAME

Gerhard Gergely; Thomas Gergely, and Irmgard Gergely, all of Gartengasse 8, A1050 Wein, Austria

Continuation-in-part of Ser. No. 655,919, Sep. 27, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,081

Claims priority, application Austria, Sep. 28, 1983, 3450/83; Fed. Rep. of Germany, Sep. 21, 1984, 3434774; May 21, 1986, 3617058

Int. Cl.[4] A61K *33/10*

U.S. Cl. 424—44 32 Claims

1. An effervescent granulate comprising:

a core of solid, edible organic acid crystals,

a first layer of calcium carbonate bonded to said core by means of a reaction product bonding layer produced by a reaction at the interface between said core and said first layer of calcium carbonate, and

a second layer of a carbonate or bicarbonate enveloping said first layer.

4,678,662

PYROPHOSPHATE COATING PROCESS FOR CALCIUM CARBONATE DENTAL ABRASIVES

Albert S. C. Chan, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 9, 1985, Ser. No. 785,702

Int. Cl.[4] C01F *11/18*; C08K *9/02*; C09C *1/02*; A61K *7/16*

U.S. Cl. 424—57 20 Claims

1. A treated calcium carbonate abrasive being the product of the method comprising contacting pulverized calcium carbonate having an average particle size of 0.2–30 microns in a liquid dispersion with an alkali metal pyrophosphate source under reactive conditions fostering the limited production of a pyrophosphate derivative selected from the group consisting of calcium pyrophosphate, calcium alkali metal pyrophosphate, and mixtures thereof so as to provide a coated calcium carbonate particle wherein the coating comprises from about 1–50% by weight of the particle of the pyrosphosphate derivative.

4,678,663

HYDROQUINONE COMPOSITION HAVING ENHANCED BIO-AVAILABILITY AND PERCUTANEOUS ADSORPTION

Richard A. Scott, Burbank; Mitchell S. Wortzman, Los Angeles, both of Calif., and Eric Jungermann, Phoenix, Ariz., assignors to Nuetrogena Corporation, Los Angeles, Calif.

Filed Feb. 6, 1984, Ser. No. 577,513

Int. Cl.[4] A61K *7/44*, *7/135*, *31/74*

U.S. Cl. 424—62 8 Claims

1. A pharmaceutical preparation having enhanced bioavailability and percutaneous adsorption comprising a mixture containing from about 20% up to about 40% (w/w) fatty alcohol having 12 to 22 carbon atoms or mixtures thereof; from about 30% up to about 60% (w/w) of a volatile silicone; from about 0.1% up to about 10% (w/w) of hydroquinone and from about 1% to about 10% of an ingredient selected from a preservative, an emulsifier or a mixture thereof.

4,678,664

MINERAL OIL GELS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Corporation, Wyandotte, Mich.

Filed Sep. 30, 1982, Ser. No. 430,175

Int. Cl.[4] A61K *7/32*, *7/34*, *7/36*, *7/38*

U.S. Cl. 424—65 10 Claims

1. In a mineral oil gel composition the improvement for achieving a stable, homogeneous gel which does not require high speed mixing, wherein said composition consists essentially of by weight about 1 to 20 percent mineral oil, about 10 to 25 percent of a polyoxyethylene-polyoxybutylene block copolymer designated as copolymer A, about 2 to 10 percent of a polyoxyethylene-polyoxybutylene block copolymer designated as copolymer B wherein said block copolymers are cogeneric mixtures of conjugated polyoxybutylene-polyoxyethylene compounds containing in their structure oxybutylene groups, oxyethylene groups and an organic radical derived from a water-soluble organic compound containing a plurality of reactive hydrogen atoms and 2 to 12 carbon atoms wherein copolymer A has a molecular weight ofthe polyoxybutylene portion of at least about 1800 and the polyoxyethylene portions contribute from about 60 to 80 percent by weight of the compound and copolymer B has a polyoxybutylene portion with a molecular weight of at least about 600 and the polyoxyethylene portion contributes from about 20 to 40 percent by weight of the compound, 0 to about 25 percent of other additives, balance water.

4,678,665

POLYANIONIC COMPOUNDS DERIVED FROM AROMATIC ETHERS OF POLYGLYCEROLS

Guy Vanlerberghe, Claye Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Aug. 2, 1984, Ser. No. 637,025

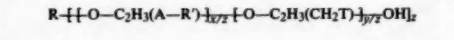
Claims priority, application Luxembourg, Aug. 2, 1983, 84 941

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.[4] A61K *7/09*; C07C *149/273*

U.S. Cl. 424—72 22 Claims

1. A product comprising a compound of formula (I)



(I)

in which R denotes an aromatic or alkylaromatic radical of valency z, of 6 to 18 carbon atoms;

A denotes CH_2 or CH_2—O;

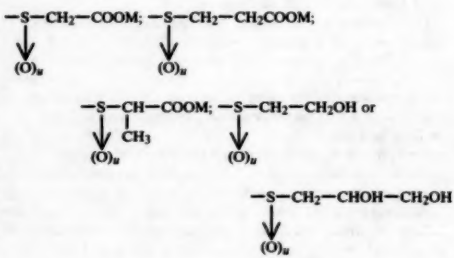
R′ denotes H, an aliphatic radical having from 1 to 16 carbon atoms, or a phenyl radical, with the proviso that R′ cannot denote H if A denotes CH_2—O;

x denotes an integer or decimal number from 1 to 8;

y denotes an integer or decimal number from 1 to 20;

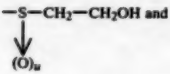
z is an integer from 1 to 3; and

T denotes

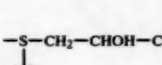


in which M denotes an alkali metal, an ammonium group or a substituted ammonium group; and

u denotes zero or 1, such that, in the product, the groups



and

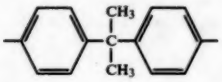


denoting T,

if present, are present in a total amount of 1% to 50% by weight of the T groups.

6. The product of claim 1 wherein

R represents



R′ represent C_9H_{19}, A represents CH_2, T represents —S—CH_2—COONa, x=2, y=13 and x=2.

13. The product of claim 1 wherein R represents

R′ represents

A represents CH_2O, T represents —S—CH_2—CH_2—COONa, x=5, y=5 and z=1.

4,678,666

TOPICAL ANTI-INFLAMMATORY COMPOSITIONS

Shigenori Nozawa; Katsumi Ohaya, both of Aichi, and Toshiji Kawazoe, Inuyama, all of Japan, assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 646,403, Sep. 4, 1984, abandoned, which is a continuation of Ser. No. 509,114, Jun. 29, 1983, abandoned. This application Aug. 14, 1986, Ser. No. 896,370

Claims priority, application Japan, Jul. 13, 1982, 57-121853

Int. Cl.⁴ A61K *31/78*

U.S. Cl. 424—81 **4 Claims**

1. A topical anti-inflammatory composition in gel ointment form comprising in an aqueous system an effective anti-inflammatory amount of piroxicam; from about 10% to about 50% by weight of a lower alkanol having from one to four carbon atoms; from about 0.2% to about 2.0% by weight of carboxyvinyl polymer; from about 5% to about 40% by weight of at least one polyhydric alcohol selected from the group consisting of lower alkylene glycol having from two to six carbon atoms, glycerine and polyethylene glycol having an average molcular weight of 200 to 2,000; and a piroxicam-solubilizing amount of from about 1.0% to about 3.0% by weight of at least one alkanolamine having from one to four carbon atoms, dialkanolamine having from two to eight carbon atoms and trialkanolamine having from three to twelve carbon atoms; and from about 0.2% by weight to about 2.0% by weight of at least one film-forming agent selected from the group consisting of carboxymethyl cellulose, hydroxyethyl cellulose and polyvinylpyrrolidone, and sufficient water to total 100%, said composition having a pH range of from about 6.5 to about 9.0.

4,678,667

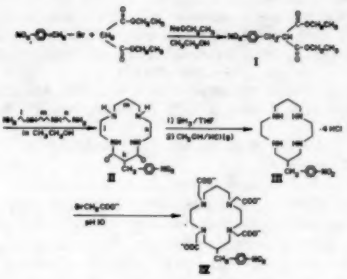
MACROCYCLIC BIFUNCTIONAL CHELATING AGENTS

Claude F. Meares, Davis; Sally J. DeNardo, El Macero, both of Calif.; William C. Cole, Houston, Tex., and Min K. Moi, Davis, Calif., assignors to 501 Regents of the University of California, Berkeley, Calif.

Filed Jul. 2, 1985, Ser. No. 751,769

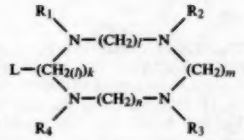
Int. Cl.⁴ A61K *39/00, 39/42, 43/00, 49/00*

U.S. Cl. 424—85 **14 Claims**



1. A copper chelate conjugate for diagnostic or therapeutic applications which involve Cu(II) localization via the systemic route, comprising:

a Cu(II) chelate of a bifunctional macrocyclic polyamine having the form:



where k, l, m, and n=1–4, and at least two of R_1–R_4 are —$CH_2CO_2^-$ acid groups, the remainder are —$CH_2CO_2^-$ or —H, L is a linker attached at one end to a ring carbon in the polyamine, and having at its other end, a chemically reactive group capable of reacting with a biomolecule, to form a chemical linkage therewith, and $CH_{2(l)}$ indicates that the ring carbon to which the linker is attached has only one hydrogen, and

chemically linked to the linker, a biomolecule selected from the group consisting of antibodies, antibody fragments, serum proteins, and bleomycin.

4,678,668

METHOD OF REDUCING SOFT TISSUE SWELLING AND PAIN

Robert L. Darras, San Pedro, Calif., assignor to MD Associates, Rolling Hills Estates, Calif.

Filed Oct. 28, 1985, Ser. No. 792,001

Int. Cl.⁴ A61K *37/48*

U.S. Cl. 424—94.75 **6 Claims**

1. A method for reducing soft tissue swelling and pain of animals comprising administering topically to the animal a composition comprising from 10 to 100 units of a proteolytic enzyme selected from the group consisting of papain, trypsin, chymotrypsin, hyalurionidase or mixtures thereof dissolved in

a transfer vehicle in an amount sufficient to transport the proteolytic enzyme through the soft tissue of the animal.

4,678,669

METHOD OF USING IMMUNIZING COMMENSALS

Jacques J. L. Ricard, Sigtuna, Sweden, assignor to Suoma Ricard and Thomas Ricard, both of Sigtuna, Sweden

Continuation of Ser. No. 269,765, Jun. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 76,061, Sep. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 883,272, Mar. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 722,767, Sep. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 593,355, Jul. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 489,874, Jul. 18, 1974, abandoned, which is a continuation of Ser. No. 32,281, Apr. 27, 1970, abandoned. This application Feb. 2, 1984, Ser. No. 576,171

Claims priority, application United Kingdom, Apr. 29, 1969, 21834/69; France, Mar. 3, 1977, 77 06300; Sep. 22, 1978, 78 27197

Int. Cl.[4] A01N *63/00, 63/02;* **A61K** *37/00*

U.S. Cl. 424—93 **29 Claims**

1. A method for controlling soil-borne pathogens in plants comprising treating said plants with a mixture containing a viable culture of Trichoderma together with the partially digested growth medium of the culture containing the propagules and metabolic products resulting from growth of the organism, which digested medium enables said Trichoderma to grow internally within the plant, said Trichoderma being present in the mixture at a concentration of at least 10^8 spores/grams of the mixture and being antagonistic with respect to the soil-borne pathogens to be controlled.

4,678,670

PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF DIABETES AND OF HEPATIC DISEASES AND MALFUNCTIONS

Dobrivoje Tomic, 11, Dell'Oro Street, Caldaro (Bolzano), Italy

Filed Feb. 5, 1985, Ser. No. 698,406

Claims priority, application Italy, Feb. 17, 1984, 19681 A/84

Int. Cl.[4] A61K *31/00*

U.S. Cl. 424—127 **6 Claims**

1. A pharmaceutical composition for the therapy of diabetes and viral hepatitis and malfunctions which consists of component (a) sodium nitrate; component (b) which is a monosaccharide or a disaccharide which is cane sugar, saccharose, lactose, glucose or honey; the ratio of component (a) and (b) being in the ratio of 1:3–3:1 and at least one excipient.

4,678,671

CONJUGATES OF ANTICOAGULANT AND PROTEIN

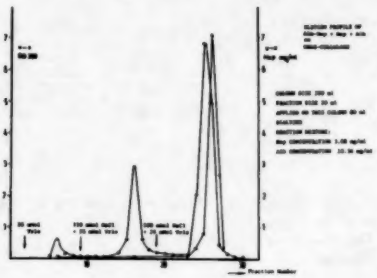
Jan Feijen, Hengelo, and Wilhelmus E. Hennink, Enschede, both of Netherlands, assignors to Cordis Europa N.V., Roden, Netherlands

Division of Ser. No. 716,197, Mar. 26, 1985, Pat. No. 4,634,762, which is a division of Ser. No. 449,248, Dec. 13, 1982, Pat. No. 4,526,714. This application Sep. 9, 1986, Ser. No. 905,573

Int. Cl.[4] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—443 **2 Claims**

1. An article including a surface having an enhanced blood compatibility coating, wherein the coating is effected from a conjugate of anticoagulant and a water soluble protein, said protein being a non-crosslinked protein or a crosslinked protein, said conjugate having been formed by coupling a protein



component and an anticoagulant with an amide bond forming agent.

4,678,672

REDUCED CALORIE CRACKERS AND PROCESSES FOR PRODUCING SAME

Clemence K. Dartey, Oakland, and Richard H. Biggs, Paterson, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 589,588, Mar. 14, 1984. This application May 21, 1985, Ser. No. 736,355

Int. Cl.[4] A21D *2/00, 8/02, 10/00*

U.S. Cl. 426—19 **78 Claims**

1. A dough composition for producing reduced calorie crackers, the composition comprising:

(a) from about 25 to about 85 percent by weight of flour;

(b) from 0 to about 10 percent by weight fat or shortening;

(c) from about 5 to about 20 percent by weight of a water-soluble polydextrose;

(d) from 0 to about 5 percent by weight of at least one emulsifier;

(e) from about 0.5 to about 5 percent by weight of a leavening system, the leavening system comprising yeast and a material which releases carbon dioxide during baking; and

(f) from about 1.5 to about 10 percent by weight of a cellulosic bulking agent,

said percentages being based upon the total weight of the dough, the total amount of the fat, shortening and emulsifier being from about 3 to about 10 percent by weight of the dough.

4,678,673

FERMENTED OILSEED PRODUCT FOR PREPARING IMITATION DAIRY PRODUCTS

Wayne E. Marshall, Spring Grove, and Constance J. Hofmann, Arlington Heights, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Mar. 9, 1984, Ser. No. 587,982

Int. Cl.[4] A23L *1/20;* **A23C** *11/06, 20/00*

U.S. Cl. 426—46 **8 Claims**

1. A method for producing an oilseed product containing diacetyl and acetylmethylcarbinol for use in preparing imitation dairy products, comprising the steps of grinding and combining with water an oilseed material selected from the group consisting of whole peanuts, cottonseeds, rapeseeds, sunflower seeds, soybeans and mixtures thereof, to provide a ground aqueous oilseed slurry comprising from about 9 percent to about 18 weight percent of the oilseed component, pasteurizing the aqueous slurry, inoculating the oilseed slurry with *Lactobacillus casei* ssp rhamnosus ATCC 39595 or diacetyl and acetylmethylcarbinol-producing microorganisms derived therefrom at an inoculum concentration level in the range of

from about 5×10^5 to about 1×10^9 cells per milliliter of the slurry, fermenting said slurry for a period of less than 8 hours, at a pH in the range of from about 6 to about 7 at a temperature in the range of from about 75° F. to about 90° F., and pasteurizing the fermented slurry to provide a fermented oilseed product having a flavor suitable for use in an imitation dairy product, a smooth texture and enhanced quantities of diacetyl and acetylmethylcarbinol.

4,678,674

SWEETENING WITH L-AMINODICARBOXYLIC ACID AMIDES

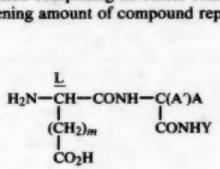
Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 795,377, Nov. 5, 1985, which is a division of Ser. No. 723,600, Apr. 15, 1985, Pat. No. 4,572,799. This application Oct. 16, 1986, Ser. No. 919,907

Int. Cl.[4] A23L *1/236*

U.S. Cl. 426—548 **25 Claims**

1. A composition comprising an edible composition and an effective sweetening amount of compound represented by the formula:



wherein

A is CO_2R wherein R is alkyl containing 1–3 carbon atoms;

A′ is hydrogen or alkyl containing 1–3 carbon atoms;

Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;

R_1 is cycloalkyl, cycloalkenyl, lower alkyl substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bicycloalkenyl or tricycloalkyl containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n is 0 or 1; and

m is 0 or 1;

and food acceptable salts thereof.

4,678,675

SWEETENING WITH L-AMINODICARBOXYLIC ACID ALKENES

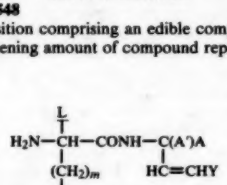
Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 730,968, May 6, 1985, Pat. No. 4,652,676. This application Oct. 14, 1986, Ser. No. 918,417

Int. Cl.[4] A23L *1/236*

U.S. Cl. 426—548 **24 Claims**

1. A composition comprising an edible composition and an effective sweetening amount of compound represented by the formula:



wherein

A is hydrogen, alkyl containing 1–3 carbon atoms or alkoxymethyl wherein the alkoxy contains 1–3 carbon atoms;

A′ is hydrogen or alkyl containing 1–3 carbon atoms;

A and A′ taken together with the carbon atom to which they are attached form cycloalkyl containing 3–4 carbon atoms;

Y is $-(CHR_2)_n-R_1$, or $-CHR_3R_4$;

R_1 is cycloalkyl, alkyl-substituted cycloalkyl, cycloalkenyl, alkyl-substituted cycloalkenyl, bicycloalkyl, alkyl-substituted bicycloalkyl, bicycloalkenyl, or alkyl-substituted bicycloalkenyl containing up to 7 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloakyl containing 3–4 ring carbon atoms;

n is 0 or 1; and

m is 0 or 1;

and food acceptable salts thereof.

4,678,676

METHOD OF PRODUCING CHEESE-LIKE EMULSIFIED FOOD

Waichi Ishizuka, and Ryoichi Aoki, both of Yokohama, Japan, assignors to Taiyo Yushi K.K., Yokohama, Japan

Filed Oct. 4, 1984, Ser. No. 657,496

Claims priority, application Japan, Oct. 4, 1983, 58-185697

Int. Cl.[4] A23J *3/00, 1/14;* **A23C** *20/02*

U.S. Cl. 426—573 **9 Claims**

1. A method of producing a cheese-like emulsified food, comprising:

(a) preparing a tofu containing 10–50% soybean solids by preparing a soy milk by extracting whole soybeans or dehulled soybeans with hot water, deodorizing the soy milk and precipitating soybean solids from the milk by adding a salt thereto;

(b) preparing a mixture of (1) from 3–30%, based on the emulsified mixture prepared prior to heating step (c), of said tofu, (2) from 5–40% of oils and fats selected from the group consisting of animal oils and fats, vegetable oils and fats and processed animal and vegetable oils and fats, (3) from 0.1 to 10% of at least one heat coagulable protein selected from the group consisting of egg white protein, blood plasma protein, whey protein concentrate, wheat gluten and fish protein in an irreversible gel forming amount and (4) from 0.1 to 5% of at least one stabilizer, the amounts of said heat coagulable protein, said oil and fat ingredient and said stabilizer being based on the amount of emulsified product produced; and

(c) blending and deaerating said mixture and thereafter heating said mixture at a temperature and for a time period sufficient to effect gelation of protein components and to effect sterilization of the resulting product.

4,678,677

PROCESS FOR PREPARING TOFU CHARGED INTO A CONTAINER

Ko Sugisawa; Yasushi Matsumura; Koji Sengoku, and Yoshiaki Nagatome, all of Nara, Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan

Filed Jun. 3, 1985, Ser. No. 740,414

Claims priority, application Japan, Jul. 4, 1984, 59-138481

Int. Cl.[4] A23L *1/20;* **A23J** *3/00*

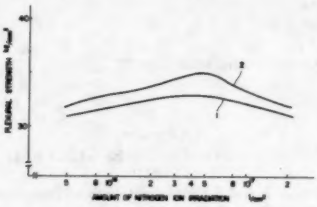
U.S. Cl. 426—634 **4 Claims**

1. A process for preparing tofu charged into a container which comprises forming a mixture by adding a coagulant to a solution selected from the group consisting of soybean milk and aqueous solution of isolated soybean protein; homogenizing the mixture within 30 minutes after addition of the coagulant, under a homogenizing pressure of no less than 30 kg/cm^2 by a pressure-type homogenizer; and coagulating the mixture by heating after it has been charged into a packaging container and sealed therein.

4,678,678
METHOD OF STRENGTHENING CERAMICS

Osami Kamigaito; Haruo Doi; Shoji Noda; Tatsumi Hioki; Akio Itoh, and Mitsutaka Kakeno, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jan. 25, 1985, Ser. No. 694,759
Claims priority, application Japan, Feb. 22, 1984, 59-31880
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 11 Claims

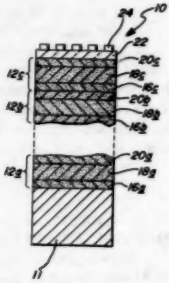


1. A method of strengthening a ceramic material as structural material, comprising forming a metal film on the surface of the ceramic material selected from the group consisting of alumina (Al_2O_3), zirconia (ZrO_2), silicon nitride (Si_3N_4), and silicon carbide (SiC), and irradiating the surface of said metal film with high energy ions of a substance which is gaseous at ambient temperature, said ions having an energy of 1 KeV to 3 MeV, so as to reduce fracture sensitivity.

4,678,679
CONTINUOUS DEPOSITION OF ACTIVATED PROCESS GASES

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 25, 1984, Ser. No. 623,858
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 26 Claims



1. A method of continuously depositing thin films of high quality semiconductor alloy material, said method comprising the steps of:

providing a deposition chamber;

maintaining a reduced pressure within the chamber;

providing a plurality of activation regions in the chamber;

providing at least one deposition region in the chamber, sdid deposition region proximately disposed relative to the activation regions;

movingly disposing substrate material in the deposition region for the continuous deposition of semiconductor alloy material thereupon;

introducing semiconductor precursor material into one of the activation regions;

introducing density of states reducing material into a different one of the activation regions;

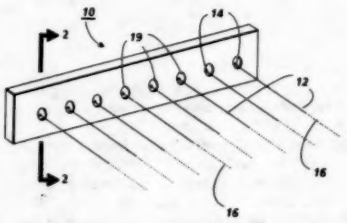
exciting the semiconductor precursor material and the states reducing material in respective ones of the activation regions by a flux of energetic gas; and,

directing the activated semiconductor precursor material and the states reducing material to the deposition region within the lifetime of the activated species, whereby a thin film of semiconductor material characterized by specifically tailored properties, including a low density of defect states, tetrahedral coordination and substantially stress-free bonding, is continuously deposited onto the substrate material.

4,678,680
CORROSION RESISTANT APERTURE PLATE FOR INK JET PRINTERS

Gerald Abowitz, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 20, 1986, Ser. No. 831,212
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 5 Claims



1. A method of producing a corrosion resistant aperture plate having a plurality of nozzles through opposing surfaces thereof which provide passageways therethrough having internal surfaces, such an aperture plate being suitable for use in a continuous stream type ink jet printer, said method comprising the steps of:

(a) cleaning the aperture plate in a clean room, and maintaining the cleanliness of the aperture plate until the method is complete;

(b) uniformly subjecting one of the surfaces of the aperture plate and some portions of the surfaces of its nozzles to an ion bombardment having an energy level of 30–50 KEV to cause at least some of said ions to penetrate at least a portion of the aperture plate and nozzle surfaces to a predetermined depth and with a predetermined density without causing embrittlement or warpage thereof through overheating, said ions becoming implanted among the molecular lattice structure of the aperture plate material, so that the corrosion protecting ion do not change the area dimension of the nozzles;

(c) rotating said one surface of the aperture plate at an angle relative to the direction of ion flow during step (b), in order to enable ion implantation substantially uniformly along at least a portion of the nozzle surfaces, as well as the surface of the aperture plate which confronts and receives the ions;

(d) inverting the aperture plate to enable the other surface thereof to confront the ion flow; and

(e) repeating step (c) so that both surfaces of the aperture plate and the entire surface of each nozzle is substantially uniformly implanted by the ions of said ion beam generating device.

4,678,681

PROCESS FOR PREPARATION OF WATER-PROOF SHEETS

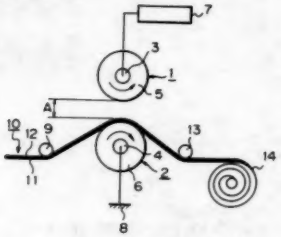
Tsutomu Obayashi, Tokyo; Shinobu Watanabe, Gunma, and Kazuhide Ino, Soka, all of Japan, assignors to Hiraoka & Co. Ltd., Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,355

Claims priority, application Japan, Oct. 5, 1984, 59-208356; Nov. 20, 1984, 59-243361

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 **11 Claims**



1. A process for the preparation of water-proof sheets from textile fibers which have been formed into a fabric, through the use of weaving, knitting or non-woven fabric forming techniques, the process comprising the steps of forming a polymer coating on both the surfaces of a fibrous fabric substrate, wherein the fibrous substrate is first treated with a water repellant, both the surfaces of the fabric are subjected to low temperture plasma treatment, and a polymer coating is then formed on both the surfaces of the fabric.

4,678,682

PROCESS FOR PRODUCING MAGNETIC RECORDING MEDIUM

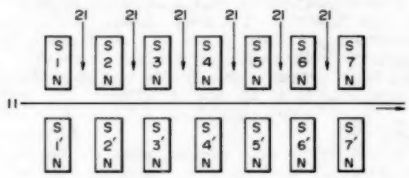
Takamitsu Asai; Goro Akashi; Tatsuji Kitamoto; Hiroshi Chikamasa, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1983, Ser. No. 496,734

Claims priority, application Japan, May 20, 1982, 57-84063; May 21, 1982, 57-84919

Int. Cl.[4] B05D *3/14*

U.S. Cl. 427—48 **3 Claims**



1. A process of producing a magnetic recording medium by drying a web having a magnetic layer containing ferromagnetic particles on a nonmagnetizable support in an undried state while orienting the magnetic layer in a magnetic filed in the direction perpendicular to the web surface, comprising; passing said web through a magnetic filed formed by plural pairs of opposite pole type magnets disposed in the travelling direction of the web with a gap between the pairs of magnets, while supplying drying air through said gaps onto the travelling web, to perform the magnets, while supplying drying air through said gaps onto the travelling web, to perform the magnetic orientation of the magnetic layer and at least substantially complete the drying of the magnetic layer while said web is within said magnetic field, wherein a partition is inserted in each gap between the magnets disposed above the travelling web so that the lower end of the partition lies close to the supper surface of the travelling web, to thereby divide each gap into a front section and a back section, the drying air being separately passed through the front and back sections of each gap.

4,678,683

PROCESS FOR COFIRING STRUCTURE COMPRISED OF CERAMIC SUBSTRATE AND REFRACTORY METAL METALLIZATION

Wayne D. Pasco, Scotia, and Ronald H. Arendt, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1985, Ser. No. 808,707

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—123 **31 Claims**

1. A process for producing a sintered structure comprised of a ceramic substrate and an adherent electrically conductive refractory metal metallization wherein said substrate is free of voids greater than about 5 microns and has a porosity of less than about 10% by volume which comprises forming a liquid phase sinterable ceramic composition consisting essentially of a ceramic powder and a liquid-forming material, said liquid-forming material containing an oxidizing agent and a member selected from the group consisting of silica, a source thereof and a mixture fhereof, said member being present in an amount of at least about 0.5% by weight of said ceramic composition, admixing said composition with an organic binding material, said organic binding material pyrolyzing at an elevated temperature ranging to less than about 800° C. leaving a residue of elemental carbon, said oxidizing agent being selected from the group consisting of alkali metal sulfate, alkaline earth metal sulfate and mixture thereof and being used in an amount at least sufficient to react with the total amount of said residue of carbon, forming said mixture into a sheet, contacting said sheet with a refractory metal metallization material, firing the resulting structure at an elevated pyrolyzing temperature ranging to less than about 800° C. pyrolyzing said organic binding material leaving a residue of elemental carbon in the sheet, increasing the firing temperature to a decarburizing temperature ranging from about 800° C. to about 1200° C. but below the temperature at which closed porosity forms in the sheet reacting said oxidizing agent with said carbon thereby decarburizing the sheet, and increasing the firing temperature to a sintering temperature ranging from above 1300° C. to about 1900° C. producing said sintered structure, said liquid-forming material being a solid material which forms a liquid in situ at said sintering temperature in an amount which enables liquid phase sintering of said ceramic composition, said liquid-forming material being present in an amount ranging from about 1% by weight to about 15% by weight of said ceramic composition, said firing being carried out in an atmosphere or vacuum which is nonoxidizing with respect to said refractory metal.

4,678,684

METHOD FOR IMPREGNATING A THERMOPLASTIC POLYMER

Michael L. Sand, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 729,729, May 2, 1985, Pat. No. 4,598,006. This application Mar. 21, 1986, Ser. No. 842,596

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.[4] A01N *17/08, 9/00;* **C11B** *9/00;* **C08K** *3/18*

U.S. Cl. 427—213.36 **11 Claims**

1. A method of forming an impregnated thermoplastic polymer, comprising:

dissolving an impregnation material in a volatile swelling agent maintained at or near supercritical conditions for the volatile swelling agent, said impregnation material being selected from the group consisting of fragrances, pest control agents and pharmaceuticals; said swelling agent

being selected from the group consisting of carbon dioxide, nitrous oxide;

swelling the thermoplastic polymer by contacting it with the impregnation material-laden volatile swelling agent at or near supercritical conditions of temperture and pressure for the volatile swelling agent; and

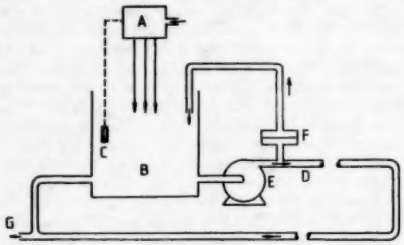
reducing the pressure whereby the volatile swelling agent diffuses out of the impregnated thermoplastic polymer.

4,678,685

METHOD FOR RAPID CONTROLLED COATING OF THE INNER SURFACES OF PIPES WITH A TENACIOUS CALCITE LINING

David Hasson, Haifa, and Mordechai Karmon, Petach-Tikva, both of Israel, assignors to Technion Research & Development Foundation, Ltd., Haifa and Mekoroth Water Co., Tel-Aviv, both of, Israel

Filed Sep. 11, 1985, Ser. No. 775,036
Claims priority, application Israel, Oct. 9, 1984, 73198
Int. Cl.[4] B05D *7/22*
U.S. Cl. 427—235 **24 Claims**



1. A method for obtaining a tenacious in situ coating deposition of calcite having a thickness of above 50 microns on the inner surface of pipes, the lining being deposited at a rate of at least 5 microns/hour, the lining having a bulk density of at least 1.5 gram/cm^3, by delivering through said pipes at a flow velocity of above 1 m/sec. an aqueous lining solution supersaturated with respect to calcium carbonate containing dissolved calcium and carbonate ions each at a concentration level of above about 80 ppm expressed as $CaCO_3$, comprising maintaining substantially stoichiometric concentrations of the CO_3^{-2} and Ca^{+2} ions, wherein the concentration of suspended CaCO3 particles is less than 50 ppm, and the excess suspended particles generated in the system are removed by physical particle removal means.

4,678,686

TREATMENT OF FORMALDEHYDE-CONTAINING WOOD PANEL PRODUCTS

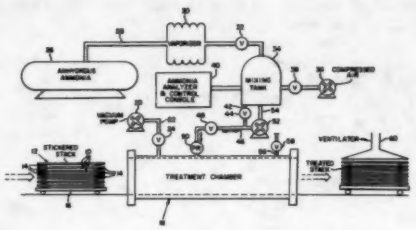
David W. Park, 1446 Heather Ct., Puyallup, Wash. 98372

Filed Apr. 15, 1986, Ser. No. 852,370
Int. Cl.[4] B05D *1/18, 3/00;* **C23C** *16/00*
U.S. Cl. 427—254 **10 Claims**

1. A process for treating a porous formaldehyde-containing wood panel to control formaldehyde emissions from the panel comprising:

placing the panel in a chamber and with closing of the chamber evacuating the chamber to establish a subatmospheric pressure therein, with the evacuation removng atmospheric gases from the chamber and gases from the pores of the panel including free formaldehyde and further producing a subatmospheric pressure within these pores,

then introducing gases ammonia into the evacuated chamber and with such introduction establishing a superatmospheric pressure therein, and with the superatmospheric pressure established permeating the panel pores with ammonia and reacting ammonia with a residual formaldehyde to convert the formaldehyde to a relatively stable hexamine residual.



4,678,687

THERMAL TRANSFER PRINTING SHEETS CONTAINING CERTAIN COATING COMPOSITIONS THEREOF

Shadi L. Malhotra, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1984, Ser. No. 666,702
Int. Cl.[4] B41M *5/26*
U.S. Cl. 427—261 **7 Claims**

1. A process for obtaining transparencies with an image thereon in thermal transfer printing systems which comprises providing a donor sheet, generating an image on the donor sheet, developing this image, and subsequently transferring the developed image to a transparency comprised of a transparent substrate containing a coating thereover of a polymer selected from the group consisting of poly(vinyl ethers), poly(acrylic acid esters), poly(methacrylic acid esters), and poly(vinylacetate).

4,678,688

METHOD FOR FORMING A SURFACE FILM OF CURED ORGANOSILICON POLYMER ON A SUBSTRATE SURFACE

Kunio Itoh; Shohei Kozakai; Yoshinori Hida; Hiroshige Okinoshima; Fumio Okada; Toshio Oba; Hisashi Shimizu; Yuji Hinoto, and Hiroshi Yoshioka, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 686,301, Dec. 26, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,906
Claims priority, application Japan, Dec. 28, 1983, 58-251952; Jan. 10, 1984, 59-2374; Apr. 17, 1984, 59-77155
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—387 **3 Claims**

1. A method for forming a cured polymeric film on the surface of a substrate which comprises: coating the substrate surface with an organosiloxazane polymer comprising room temperature-curable organosilicon polymer comprising

(a) at least one organosiloxane unit represented by the unit formula

$$R^1_aSiO_{(4-a)/2},$$

and

(b) at least one organosilazane unit represented by the unit formula

$$R^2Si(NR^3)_{3/2},$$

in which R^1, R^2 and R^3 are each a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group, not all of them being simultaneously hydrogen atoms, and the subscript a is a positive integer of 1, 2 or 3;

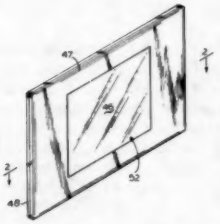
and subjecting the coating film to exposure to an atmosphere containing moisture.

4,678,689

TRANSPARENCY LAMINATION PROCESS

Randall Phillips, 40 W. 22nd St., 11th Floor, New York, N.Y. 10010, assignor to Randall Phillips and Sumiko Phillips, a part interest

Filed Jun. 20, 1985, Ser. No. 746,857
Int. Cl.[4] B44F *1/02, 1/06*
U.S. Cl. 428—13 11 Claims



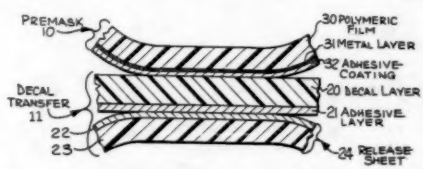
1. A laminated transparency comprising:
a transparency having a top and bottom face;
clear plastic sheets extending over the top and bottom face of the transparency;
a mat finish on the bottom face of the bottom plastic sheet; and,
lamination means for laminating the sheets and transparency together to provide a completely sealed transparency for viewing and to protect the transparency.

4,678,690

PREMASKED DECAL

Emery A. Palmer, Matthews; Michael A. Shimanski, Charlotte; Thomas M. Ellison, Charlotte, and Jack P. Everidge, Charlotte, all of N.C., assignors to Rexham Corporation, New York, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,671
Int. Cl.[4] B44C *1/165*
U.S. Cl. 428—31 17 Claims



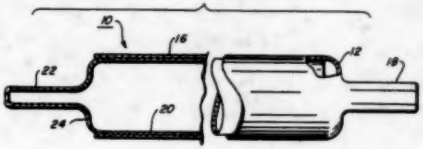
1. A premasked decal, comprising:
a decal transfer; and
a strippable tinted transparent premask adhered to the front surface of said decal transfer with the decal transfer being visible therethrough, said premask having a neutral optical density of from 0.1 to 0.9 to impart to the premask a readily visible contrasting appearance against any adjacent background color so as to visually indicate the need for removal of the premask from the installed decal transfer.

4,678,691

ELECTROFORMING PROCESS AND PRODUCT

William G. Herbert, Jr., Williamson; Henry G. Grey, Webster, and Bruce C. Reynolds, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1985, Ser. No. 791,043
Int. Cl.[4] B41C *3/08;* B32B *31/00*
U.S. Cl. 428—36 15 Claims



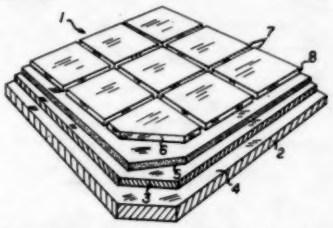
1. A composite metal article comprising a first elongated electroformed hollow member and a second electroformed elongated hollow member, each of said hollow members comprising at least a first sleeve and a second sleeve, one sleeve of each of said hollow members having a perimeter smaller than the perimeter of the other sleeve of the same member, at least a segment of the outer surface of one sleeve of the second elongated hollow member being adjacent to and substantially surrounded by at least a segment of the inner surface of one sleeve of the first elongated hollow member.

4,678,692

MULTILAYER PROTECTION SYSTEM

Julian Porter, 4674 Alvarado Cyn Rd., San Diego, Calif. 92120

Filed Apr. 29, 1985, Ser. No. 728,472
Int. Cl.[4] B32B *3/00, 15/04*
U.S. Cl. 428—78 10 Claims



1. A series of coatings for providing protection of an underlying metal structure which comprises:
a corrosion protection layer fixed to said underlying metal structure composed of a material more anodic than said underlying metal structure;
an insulating layer composed of an impermeable electrically insulating material which fully covers and is fixed to said corrosion protection layer; and
a discontinuous fouling protection layer composed of biologically fouling resistant material segments which are fixed to and cover the majority of said insulating layer.

4,678,693

INSULATING FABRIC AND METHOD OF MANUFACTURE THEREOF

Philip Kemp, Closter, N.J., assignor to J. E. Morgan Knitting Mills, Inc., Tamaqua, Pa.

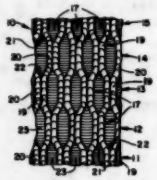
Filed Jan. 29, 1986, Ser. No. 823,674
Int. Cl.[4] B32B *33/00*
U.S. Cl. 428—91 10 Claims

1. An insulating fabric having an inner fabric face of soft texture formed of a high bulk yarn and an outer fabric face formed of a combined synthetic and cotton yarn, said insulating fabric being characterized by an increase in thickness as the

result of plural washings to enhance its heat insulating quality and comprising

(a) a base fabric constituted of a knitted thermal fabric having air-entrapping cells,

(b) said base fabric being knitted of a napped high bulk yarn



in selected courses and being knitted of a combined synthetic and cotton yarn in courses intervening between the selected courses.

(c) the combined synthetic and cotton yarns forming a knitted framework for anchoring and stabilizing the high bulk yarn in the fabric.

4,678,694

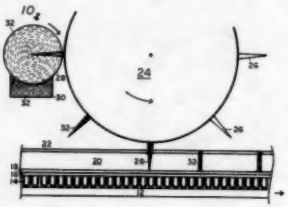
ANTISTATIC CARPET TILE AND METHOD OF MANUFACTURING SUCH CARPET TILE

Johannes A. H. Claessen, Leusden, Netherlands, assignor to Heuga Holding b.v., Scherpenzeel, Netherlands

Filed Apr. 7, 1986, Ser. No. 848,775

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—95 **34 Claims**



1. An antistatic carpet tile having an electrical resistivity of about 1×10^8 ohms square or less, which carpet tile comprises:

(a) an electrically conductive fibrous-face material;

(b) a primary backing sheet, the fibrous-face material secured to the primary backing sheet;

(c) an electrically conductive precoat layer secured to the primary backing sheet;

(d) a polymeric electrically insulating backing layer having a back surface;

(e) a plurality of spaced-apart thin columns of a solid electrically conductive material extending generally perpendicularly to the plane of the carpet tile face from the back surface of the backing layer through the backing layer and to the precoat layer, to provide an electrical conductivity pathway from the precoat layer to the back surface of the backing layer;

(f) a secondary backing sheet secured to the back surface of the backing layer; and

(g) an electrically conductive coating layer on the secondary backing sheet and connected to a plurality of the ends of the columns on the back surface, to provide an electrical pathway to the electrically conductive fibrous face, through the electrically conductive precoat layer and through said columns to ground.

4,678,695

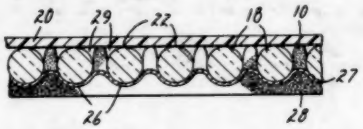
ENCAPSULATED FLATTOP RETROREFLECTIVE SHEETING AND METHOD FOR PRODUCING THE SAME

Chi F. Tung, Mahtomedi, and Chester A. Bacon, Jr., Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1985, Ser. No. 812,523

Int. Cl.[4] B32B *7/00, 15/00*; G02B *5/124, 5/128*

U.S. Cl. 428—120 **15 Claims**



1. A retroreflective sheet comprising a monolayer of microspheres supported in a layer of binder material, a layer of reflective material disposed behind said microspheres, and a cover film disposed in spaced relation in front of said microspheres, wherein additional binder material forms a network of walls extending from said layer of binder material into adherent contact with said cover film and at least some microspheres are individually surrounded by said walls.

4,678,696

WEATHER STRIP

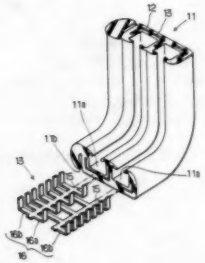
Kunio Maeno, Aichi, and Hisayuki Kisanuki, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 9, 1986, Ser. No. 849,944

Claims priority, application Japan, Apr. 10, 1985, 60-53249[U]

Int. Cl.[4] E06B *7/16*

U.S. Cl. 428—122 **2 Claims**



1. A weather strip comprising:

(a) an insert made of metal and having W section; and

(b) a cover member adapted to cover said insert and made of polymeric resilient materials;

said insert being formed from a metal piece,

said metal piece including two longitudinally extending primary portions in parallel relation and a multiplicity of secondary portions extending perpendicularly to said primary portions, each of said secondary portions having a connecting portion interconnecting said primary portions and two projecting portions extending outwardly from opposite ends of said connecting portion,

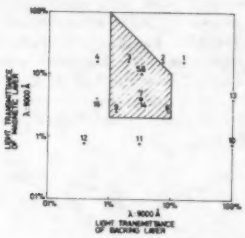
said projecting portions being bent upwardly while preselected connecting portions being cut off from one of said primary portions and bent upwardly at their centers.

4,678,697

MAGNETIC RECORDING MEDIUM

Takahito Miyoshi; Masaaki Fujiyama; Toshimitu Okutu; Kenichi Masuyama, and Norio Nasu, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 19, 1985, Ser. No. 702,550
Claims priority, application Japan, Feb. 17, 1984, 59-28135
Int. Cl.[4] G11B 5/68
U.S. Cl. 428—141 12 Claims



1. A magnetic recording medium comprising a nonmagnetic support having coated on each surface thereof a magnetic layer containing a magnetic substance and a binder-containing backing layer, wherein the backing layer has a thickness of 2 μm or less, wherein the magnetic layer has a light transmittance of 2% or more for light having a wavelength of 900 nm, the backing layer has a transmittance of from 1 to 10% for light having a wavelength of 900 nm, and the magnetic recording medium as a whole has a transmittance of 1% or less for light having a wavelength of 900 nm, and the backing layer has a center line average roughness (Ra) of 0.05 μm or less at a cut-off value of 0.08 mm, wherein one or both of the magnetic layer and the backing layer contains colored particles, at least the magnetic layer containing the colored particles in an amount of not more than 10 parts by weight per 100 parts by weight of the ferromagnetic substance, the magnetic layer further containing Co-containing magnetic iron oxide particles having a specific surface area (S_{BET}) of not less than 35 m^2/g.

4,678,698

CONTACT LENS CLEANING ARTICLE

Arlene J. Mencke, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 729,288, May 1, 1985, Pat. No. 4,622,258, which is a division of Ser. No. 484,163, Apr. 12, 1983, Pat. No. 4,539,399. This application Jul. 30, 1986, Ser. No. 891,865
Int. Cl.[4] B32B 5/14
U.S. Cl. 428—171 18 Claims

1. An article comprising a non-woven fibrous web selected from webs of the group consisting of polyalkylene, polyvinyl chloride, polyamide, polystyrene, polyarylsulfone, polyester, and polyurethane fibers and combinations, blends and copolymers thereof, said non-woven fibrous web having an average fiber diameter up to 50 microns and the web further comprises a surfactant physiologically acceptable to the eye, said article being a contact lens cleaner.

4,678,699

STAMPABLE POLYMERIC COMPOSITE CONTAINING AN EMI/RFI SHIELDING LAYER

Gina R. Kritchevsky, Scotch Plains; John A. Gregor, Basking Ridge; Manfred W. Gruendig, Long Valley; Gregory J. Sellers, Clinton, and Barbara Liss, Verona, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 436,238, Oct. 25, 1982, abandoned. This application Jan. 11, 1985, Ser. No. 690,388
Int. Cl.[4] H05K 9/00
U.S. Cl. 428—175 16 Claims

1. A stamped thermoplastic composite comprising:

at least one thermoplastic layer; and at least one shielding layer, the shielding layer comprising at least one layer of thermoplastic woven fiber containing metal fiber and having an elongation to break of at least 8 percent and an EMI/RFI shielding effectiveness of at least 30 dB, and the stamped composite having been elongated at least 8 percent without holes formed by tearing of the shielding layer during stamping.

4,678,700

FIBROUS COMPOSITE MATERIALS

Kevin T. McAloon, and Allan T. Brew, both of Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 28, 1985, Ser. No. 738,647
Claims priority, application United Kingdom, Jun. 6, 1984, 8414439
Int. Cl.[4] B32B 27/14, 9/00; C03B 37/00
U.S. Cl. 428—198 13 Claims

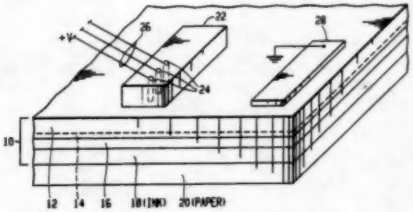
1. A fibrous composite material consisting essentially of carbon fibers and lamellae of chemically delaminated vermiculite wherein the fibers comprise at least 10% by weight of the composite.

4,678,701

RESISTIVE PRINTING RIBBON HAVING IMPROVED PROPERTIES

Keith S. Pennington, Somers; Ali Afzali-Ardakani, White Plains, and Krishna G. Sachdev, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,525
Int. Cl.[4] B41M 5/26
U.S. Cl. 428—213 15 Claims



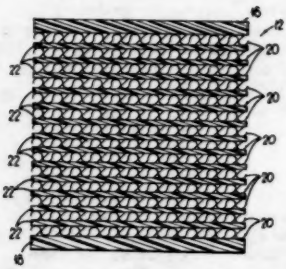
1. A resistive ribbon for thermal transfer printing, comprising:

a resistive layer through which electrical current passes to effect said printing, said resistive layer including a phase separated surface region imparting enhanced mechanical and thermal properties to said resistive layer, said phase separated surface region including a material selected from the group consisting of graphite fluoride, fluorocarbon resins, and CeF_4,

a thin layer of an electrically conductive material through which said electrical current passes, said thin layer being adjacent said phase separated surface region and

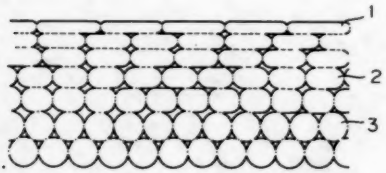
a thermally fusible ink layer capable of being melted once said electrical current flows through said resistive layer.

4,678,702
PROTECTIVE LAMINATE
Robert L. Lancaster, Atlanta, and Raymond E. Shaw, Roswell, both of Ga., assignors to Petro Products, Inc., Atlanta, Ga.
Filed Jul. 30, 1986, Ser. No. 891,455
Int. Cl.[4] B32B 7/00
U.S. Cl. 428—252 14 Claims



1. A laminate comprising layers of a fabric woven from yarn of poly-(p-phenylene terephthalamide) bonded together by intervening layers of an ionic copolymer which is the product of the reaction of an olefin and metallic salt of an unsaturated monocarboxylic acid.

4,678,703
NONWOVEN SHEET HAVING SMOOTH FILMY SURFACE LAYER
Akio Shibasaki, Moriyama, and Hirofumi Iwasaki, Ashiya, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan
Filed Mar. 15, 1985, Ser. No. 712,239
Claims priority, application Japan, Mar. 16, 1984, 59-49229
Int. Cl.[4] B32B 5/00, 31/22; D04H 1/54, 3/14
U.S. Cl. 428—288 8 Claims



1. A nonwoven sheet consisting essentially of polyethylene terephthalate filaments with a birefringence index within the range of from 0.02 to 0.07 and constructed by entangling the filaments in a three-dimensional state wherein at least one of the surface layers thereof is a smooth filmy layer of an average roughness of 25μ or below, formed by flattening said surface layer so that the filaments forming the same surface layer crush flat and bury each other at the crossing sections and are fused at the intersecting surfaces, and the layer next to said surface layer consists of a plurality of filaments adhering closely to each other and practically maintaining the original form thereof.

4,678,704
IMPREGNATED SUBSTRATE INCORPORATING AN INDICATOR DYE
Adrian N. Fellows, Hedben Bridge, England, assignor to Fibre Treatments (Holding) Limited, Burnley, England
Filed Jul. 24, 1986, Ser. No. 889,793
Claims priority, application United Kingdom, Jul. 24, 1985, 8518736
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—289 11 Claims

1. An impregnated fabric material comprising a fabric substrate to which has been bonded an active cationic impregnant characterized in that there has also been applied to the substrate an anionic indicator dye in combination with a further cationic component, and in that the dye bonds to the further cationic component more readily than to the substrate and that the further cationic component competes with the impregnant for bonding to the dye.

4,678,705
COMPOSITION AND METHOD FOR MAKING MAGNETIC RECORDING ELEMENTS
Hendrikus F. Huisman, Teteringen, and Henricus J. M. Pigmans, Eindhoven, both of Netherlands, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 3, 1985, Ser. No. 751,675
Claims priority, application Netherlands, Jul. 5, 1984, 8402136
Int. Cl.[4] G11B 5/708
U.S. Cl. 428—315.9 2 Claims

1. A method for manufacturing magnetic recording elements which comprises the sequential steps of

a. coating onto a surface of a nonmagnetic carrier a layer of a composition which comprises
   (1) finely divided particles of magnetic particles dispersed in a liquid medium comprising
   (2) film-forming polymeric binder,
   (3) 0.2–20% wt. lubricant, basis solvent-free layer,
   (4) 0.5–6% wt. dispersing agent, basis magnetic pigment, and
   (5) porosity control agent selected from metal salts of carboxylic acids, nonionogenic diurethanes, calcium-containing micellar organic complexes and mixtures thereof, all of (2) through (5) being dispersed in
   (6) volatile organic solvent:
b. removing essentially all of the volatile organic solvent by evaporation from the coated layer;
c. compressing the solvent-free coated layer, thus forming in the layer a structure of pores having a diameter of 5–100 nm, a pore volume which is 5–50% of the volume of the compressed layer, and a pore surface area which is at least 100 times the free surface area of the compressed layer.

2. A magnetic recording element which comprises a nonmagnetic carrier having coated on at least one surface thereof a compressed solvent-free layer of finely divided magnetic pigment particles dispersed in a porous matrix containing a polymeric binder, lubricant, dispersing agent, and a porosity control agent selected from metal salts of carboxylic acids, nonionogenic diurethanes, calcium-containing micellar organic complexes and mixtures thereof, the pores of the layer having a diameter of 5–100 nm, a volume which is 5–50% of the volume of the compressed layer and surface area which is at least 100 times the free surface area of the exposed surface of the compressed layer.

4,678,706

MAGNETIC RECORDING MEDIUM

Fumihiro Tokunaga; Takamitsu Asai, and Masaaki Fujiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 24, 1985, Ser. No. 791,174

Claims priority, application Japan, Oct. 24, 1984, 59-222233

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—323 **17 Claims**

1. A magnetic recording medium comprising a non-magnetic support, a magnetic recording layer on one side of the support, and a backing layer on the opposite side of the support to the magnetic recording layer, wherein said backing layer comprises a binder and a powder dispersed in the binder, wherein the powder is a powdered oxide represented by the formula $M^1.M^2.O_{2+x}$, wherein M^1 is at least one element selected from the group consisting of Ba, Sr, Pb and Ca; M^2 is at least one element selected from the group consisting of Ti, Zr and Sn; and x is in the range of from 0 to 0.9, or a mixture of said powdered oxide and carbon black, wherein the ratio of the total amount of the powder in the backing layer to the total amount of the binder in the backing layer is in the range of from 0.3:1 to 2:1 by weight, the mixing ratio of the powdered oxide to the carbon black is 1:9 or more by weight and wherein the powdered oxide has an average particle diameter of 0.5 μm or less.

4,678,707

VIBRATION DAMPING COMPOSITE LAMINATE

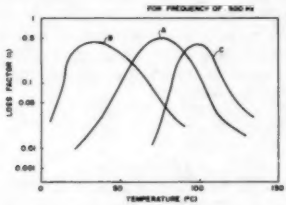
Masatoshi Shinozaki, Mobara; Yoshihiro Matsumoto, Chiba; Yoshiki Aoyagi, Yokohama, and Kazuhisa Kojima, Machida, all of Japan, assignors to Kawasaki Steel Corporation, Hyoga, Japan

Filed Jun. 26, 1985, Ser. No. 749,018

Claims priority, application Japan, Jun. 29, 1984, 59-134737

Int. Cl.[4] B32B *5/16, 15/08, 27/42*

U.S. Cl. 428—323 **15 Claims**



1. A vibration damping composite laminate of the constrained layer damping type comprising:

two layers of a metal in parallel arrangement; and

a layer of a viscoelastic polymer composition which is closely interposed between the two metal layers and comprises a polyvinyl acetal resin blended with particulate carbon in an amount of 10 to 80% of the polymer composition, the ratio of the mean particle size of said particulate carbon to the thickness of the polymer composition layer being in the range from 0.5 to 1.7, said mean particle size being determined by the equation $R=100\ \exp(-D_p/D_{p0})^n(\%)$ wherein n is a constant determined by the type of particulate carbon being used and D_{p0} is the particle size at which R becomes 36.8%, and wherein the value of D_p when R becomes 50% is the mean particle size of the particulate carbon before mixing, said polymer being electrically conductive so that the laminate can be spot-welded to metal structures.

4,678,708

MAGNETIC RECORDING MEDIUM

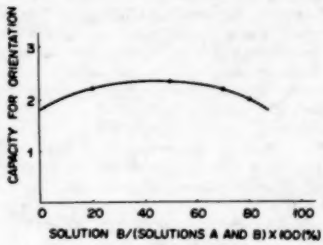
Shigeru Shimada, Saku; Masaharu Nishimatsu, Komoro; Hiroyuki Arioka, Saku, and Yuichi Kubota, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 804,223, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 645,043, Aug. 28, 1984, abandoned. This application Dec. 11, 1985, Ser. No. 807,825

Claims priority, application Japan, Sep. 2, 1983, 58-160416

Int. Cl.[4] G11B *5/702*

U.S. Cl. 428—336 **9 Claims**



1. A magnetic recording medium produced by

A. modifying a four component copolymer of (A) vinyl chloride, (B) a vinyl carboxylate, (C) an unsaturated carboxylic acid and (D) an unsaturated carboxylic anhydride, containing 50 to 80% by weight of (A) based on the total of (A) and (B), 10 to 30% by weight of (D) based on the total of (C) and (D) and a total of 1 to 5 parts by weight of (C) and (D) based on 100 parts by weight of (A) and (B) and having an average polymerization degree of 100 to 400 with a radiation polymerizable monomer to produce a radiation sensitive curing copolymer, B. mixing the radiation sensitive curing polymer with another polymer which is not radiation sensitive to produce a polymer mixture containing from 10% to 80% by weight of the radiation copolymer,

C. mixing the polymer mixture resulting from Step B with a magnetic powder to produce a magnetic paint,

D. applying the magnetic paint to a non-magnetic substrate, and

E. exposing resulting coating to radiation thereby curing the polymer mixture.

4,678,709

ELECTRICAL INSULATION

Stephen L. Tondre, Menlo Park, and Hans E. Lunk, Fremont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 536,919, Sep. 27, 1983, Pat. No. 4,521,485, which is a continuation-in-part of Ser. No. 418,355, Sep. 15, 1982, abandoned. This application May 28, 1985, Ser. No. 738,622

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.[4] B32B *15/08;* **H01B** *7/00*

U.S. Cl. 428—380 **19 Claims**

1. An insulated electrical article, comprising

(a) a metal conductor;

(b) a melt-shaped inner insulating layer comprising a first organic polymer component which is a cross-linked olefin polymer, and

(c) a melt-shaped outer insulating layer which contacts the inner insulating layer and which comprises a second organic polymer component which is a substantially linear aromatic polymer having a glass transition temperature of at least 100° C.

4,678,710

COATED PARTICULATE MATERIALS AND METHOD FOR MANUFACTURE THEREOF

Selichiro Sakimoto; Kazuo Fujita; Yutaka Yamauchi, and Hiroshi Matsue, all of Kawasaki, Japan, assignors to Showa Denko K. K., Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,195
Claims priority, application Japan, Oct. 22, 1984, 59-220538
Int. Cl.[4] B05D *7/00*; B32B *5/16*; C08K *9/00*; C08F *32/00*
U.S. Cl. 428—407 6 Claims

1. Coated particulate materials, comprising:

(A) water-soluble particulate materials and

(B) a coating deposited on the entire surface of said particulate materials and consisting essentially of a copolymer of (a) either (1) cyclopentadiene oligomer or (2) an addition product-containing cyclopentadiene oligomer formed of cyclopentadiene and up to 5% by weight, based on cyclopentadiene, of a chain conjugate diene formed by the Diels-Alder type addition polymerization and (b) an unsaturated fatty acid oil

wherein the ratio of said cyclopentadiene oligomer or said addition-product to said unsaturated fatty acid oil is 0.2–5.0 parts of said oligomer or said addition-product to one part of said unsaturated fatty acid oil, and

wherein said cyclopentadiene oligomer or said addition-product has a molecular weight in the range of 200–5,000.

4,678,711

PROCESS FOR PROMOTING THE ADHESION OF EPOXY BONDED FIBER REINFORCED PLASTICS

Kenneth E. Atkins, South Charleston; Raymond C. Gandy, St. Albans, and William A. Larck, Scott Depot, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 3, 1985, Ser. No. 783,535
Int. Cl.[4] B32B *25/38*; C09J *5/04*
U.S. Cl. 428—414 22 Claims

1. A process of bonding shaped fiber reinforced polymer substrates together, comprising:

applying a self-crosslinkable acrylic polymer latex primer to the bonding surface of each of said substrates and allowing said primer to dry,

applying an epoxy adhesive, in an amount sufficient to effect adhesion, to the bonding surfaces thus primed, and

contacting the bonding surfaces thus primed and epoxied with one another, under conditions sufficient to cure the epoxy, to achieve bonding.

4,678,712

CURABLE COATING COMPOSITION AND EPOXY RESIN ADDUCT USEFUL THEREIN

Brian W. Elliott, Alconbury, Great Britain, assignor to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/GB85/00167, § 371 Date Feb. 3, 1986, § 102(e) Date Feb. 3, 1986, PCT Pub. No. WO85/04666, PCT Pub. Date Oct. 24, 1985
PCT Filed Apr. 12, 1985, Ser. No. 815,081
Claims priority, application United Kingdom, Apr. 13, 1984, 8409670
Int. Cl.[4] C08G *59/64*
U.S. Cl. 428—418 5 Claims

1. A curable coating composition comprising (1) a component having more than one 1,2-epoxy group and (2) a component having more than one group reactive with the epoxy groups of component (1), wherein component (2) is an adduct formed by reacting an epoxy resin, a polyhydric phenol and an aliphatic hydroxyl-containing amine wherein at least 1.2 equivalents of the polyhydric phenol are employed for each equivalent of the epoxy resin, the equivalents of epoxy resin being based on the number of epoxy groups which are not reacted with the amino hydrogens of the aliphatic hydroxyl-containing amine, said adduct having terminal aliphatic —OH groups, and having epoxy groups or groups reactive with an epoxy group.

4,678,713

CO-EXTRUDED LAMINATES CONTAINING CARBON MONOXIDE INTERPOLYMERS

Gerald M. Lancaster, Surfside, and James A. Allen, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 645,990, Aug. 31, 1984, Pat. No. 4,601,948, which is a continuation-in-part of Ser. No. 531,110, Sep. 12, 1983, Pat. No. 4,600,614. This application May 28, 1985, Ser. No. 738,007
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—421 34 Claims

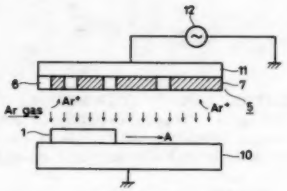
1. A co-extruded, multi-ply laminate comprising at least two different extrudable polymers wherein at least one ply comprises a carbon monoxide-containing polymer which is adhered to a ply comprising at least halopolymer.

4,678,714

PHOTOMASK MATERIAL

Yaichiro Watakabe, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1986, Ser. No. 819,104
Claims priority, application Japan, Jan. 28, 1985, 60-16206
Int. Cl.[4] B22B *15/00*
U.S. Cl. 428—432 3 Claims



1. A photomask material comprising a transparent glass substrate and a metal silicide film formed on said transparent glass substrate, the metal silicide film having a lower surface contacting the substrate and an upper surface opposed to the lower surface, the improvement wherein

the rate of deposition of silicon in relation to metal contained in said metal silicide film is continuously varied so as to increase the amount of metal toward the upper surface of the metal silicide film.

4,678,715

PROCESS FOR IMPROVING WOOD AND USE OF THE IMPROVED WOOD

Eberhard Giebeler, Mülheim, and Gerhard Wilhelm, Ladenburg, both of Fed. Rep. of Germany, assignors to Ruetgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 10, 1986, Ser. No. 817,932
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504898
Int. Cl.[4] B32B *21/04*, *21/06*; B05D *1/18*, *3/02*
U.S. Cl. 428—537.1 17 Claims

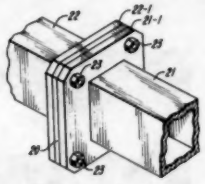
1. A process for improving wood to impart dimensional stability and resonant properties thereto comprising subjecting wood babies to controlled conditions of elevated temperature and pressure in a closed reaction zone, introducing controlled amounts of at least one polymerizable monomer into said reaction zone under conditions whereby said monomer will polymerize and thereby to deposit a thermoset polymer into the capillary walls of the wood without clogging the capillary passages of the wood, said controlled amount being 0.1 to 2.5 weight percent relative to the dry weight of the wood.

16. Wood improved according to the method of claim 1.

4,678,716
ELECTROMAGNETIC SHIELDING

Wen-Shian V. Tzeng, Reading, Mass., assignor to Chomerics, Inc., Woburn, Mass.

Filed Aug. 6, 1985, Ser. No. 762,962
Int. Cl.[4] R22F 3/00
U.S. Cl. 428—551 18 Claims



1. An electrically conductive particle for use as a conductive filler in a resin matrix suitable for electromagnetic shielding use,

said particle comprising an inner core of an aluminum silicon alloy having from 5 to 20 percent by weight of silicon,

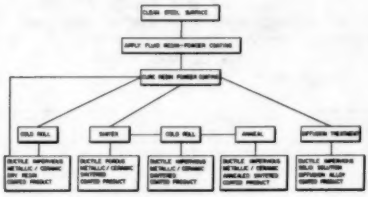
an intermediate layer of a metal selected from the group consisting of mercury, palladium, copper, chromium, platinum, gold, nickel, tin, zinc and mixtures thereof,

and an outer layer of a highly electrically conductive metal.

4,678,717
POWDER METAL AND/OR REFRACTORY COATED FERROUS METALS

Richard A. Nickola, Highland; Brian A. Sok, Cedar Lake, and Shashi B. Agarwal, Griffith, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 511,570, Jul. 7, 1983, Pat. No. 4,542,048.
This application Sep. 17, 1985, Ser. No. 776,786
Int. Cl.[4] B22F 7/04
U.S. Cl. 428—553 13 Claims


CLEAN STEEL SURFACE
APPLY FLUID RESIN-POWDER COATING
CURE RESIN POWDER COATING
COLD ROLL
SINTER
COLD ROLL
ANNEAL
DIFFUSION TREATMENT
DUCTILE IMPERVIOUS METALLIC / CERAMIC RESIN COATED PRODUCT
DUCTILE POROUS METALLIC / CERAMIC SINTERED COATED PRODUCT
DUCTILE IMPERVIOUS METALLIC / CERAMIC SINTERED COATED PRODUCT
DUCTILE IMPERVIOUS METALLIC / CERAMIC ANNEALED SINTERED COATED PRODUCT
DUCTILE IMPERVIOUS SOLID SOLUTION DIFFUSION ALLOY COATED PRODUCT

1. A solid solution iron-aluminum diffusion alloy coated steel strip comprising

a low carbon low titanium alloy steel strip which has a solid solution iron-aluminum diffusion alloy surface coating formed in situ by diffusion heating in a nonoxidizing atmosphere a strip of said steel having a surface coating of powder metal selected from the group consisting of aluminum, aluminum and silicon mixture containing between about 5 and 12 wt. % silicon, and aluminum-silicon alloy containing between about 5 and 12 wt. % silicon, said diffusion heating being effected without adversely increasing the grain size of the steel,

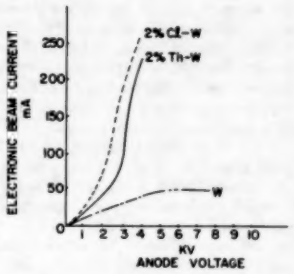
said diffusion alloy coating having a surface concentration of aluminum of at least about 8 wt. % aluminum and said coating being directly bonded to the steel without an intervening subsurface layer, and

said diffusion alloy coated steel strip being adapted to be severely deformed at room temperature without objectionable crazing or cracking of said coating and being resistant to high temperature oxidation after such deformation.

4,678,718
PROCESS AND USAGE OF CERIATED TUNGSTEN ELECTRODE MATERIAL

Ju-Zhen Wang, Shanghai, China, assignor to Shanghai Lamp Factory, Shanghai, China

Filed Sep. 3, 1985, Ser. No. 771,743
Claims priority, application China, Apr. 1, 1985, 85100484
Int. Cl.[4] B22F 7/04
U.S. Cl. 428—560 13 Claims



1. A process utilizing a powder metallurgical technique in forming a ceriated-tungsten electrode including the steps of

(a) preparing a quantity of tungsten trioxide,

(b) preparing a cerium nitrate solution,

(c) adding a sufficient quantity of cerium nitrate solution to the tungsten trioxide to provide 1–4.5% by weight cerium oxide to the ceriated-tungsten electrode material,

(d) drying and calcining the resulting mixture, then reducing the dried and calcined mixture in a reducing atmosphere,

(e) pressing the reduced product into bar form,

(f) presintering and sintering the bar under reducing conditions,

(g) forging and annealing the bar,

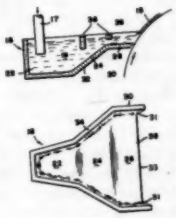
(h) preparing a wire by drawing the bar to a diameter of less than 3.0 mm, and

(i) recovering the ceriated tungsten product.

4,678,719
METHOD AND APPARATUS FOR CONTINUOUS CASTING OF CRYSTALLINE STRIP

Robert H. Johns, and John D. Nauman, both of Natrona Heights, Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 560,373, Sep. 13, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 876,308
Int. Cl.[4] B22D 11/06, 11/10
U.S. Cl. 428—593 29 Claims



1. Method of directly casting molten metal to continuous strip of crystalline metal, comprising:

supplying molten metal to a receiving end of a casting vessel having a receiving end and an exit end, the exit end being adjacent to a casting surface and having edges thereof

parallel to the casting surface and having a substantially uniform cross-sectional area over a length;

moving the cooling casting surface generally upwardly past the exit end;

feeding molten metal with a gradually increasing width of flow while maintaining a substantially uniform cross-sectional area or a slightly increasing cross-sectional area of flow from the receiving end to the exit end to provide a pool of molten metal having a substantially uniform flow and a free upper surface in the exit end of the casting vessel;

flowing molten metal from the exit end onto the moving casting surface with a substantially uniform flow across the width of the exit, the surface tension of the flowing metal forming all the surfaces of the strip to be cast, the surface tension of the free surface of the molten metal pool forming the top of the cast strip, the surface tension of the molten metal leaving the bottom of the exit end maintaining a meniscus between an inside surface of the bottom of the exit end and the casting surface to form the bottom of the cast strip; the surface tension of the molten metal leaving two sides of the exit end forming the edges of the cast strip and being about as wide as the strip being cast;

controlling the depth of molten metal in the exit end of the vessel and the distance between the exit end and the casting surface to maintain the surface tension of the molten metal on the top, bottom and sides; and

removing cast strip from the moving casting surface.

15. An apparatus for directly casting molten metal to continuous strip of crystalline material, comprising:

movable casting surface;

casting vessel having a receiving end, an exit end, and an intermediate section therebetween, said vessel having a cross-sectional area from receiving end to exit end being substantially uniform or slightly greater at the exit end;

means for supplying molten metal to the receiving end of the casting vessel;

said casting vessel having an exit end having a generally U-shaped structure adjacent the casting surface and edges thereof substantially parallel thereto, and an intermediate section having a gradually increasing width to the exit end to facilitate a substantially uniform flow of molten metal from the receiving end to the exit end, the U-shaped structure of the exit end having a planar bottom wall and diverging inside sidewalls opening upwardly and having a width between the inside surfaces about as wide as the strip to be cast, the exit end having fixed width along the bottom wall between the inside surfaces of the sidewalls and a substantially uniform cross-sectional area over a length sufficient to provide a substantially uniform flow of molten metal from the exit end;

said casting surface movable generally upwardly past the exit end of the casting vessel at a distance of between 0.005 to 0.060 inches therefrom and at a speed of 20 to 500 feet per minute.

28. A continuous strip of crystalline metal directly cast from molten metal having a substantially uniform flow and free upper surface onto a single moving casting surface wherein the molten metal flows from a vessel which has a receiving end and an exit end with a gradually increasing width of flow while maintaining a substantially uniform cross-sectional area or a slightly increasing cross-sectional area from the receiving end to the exit end and substantially uniform cross-sectional area of flow over a length at the exit end, the strip comprising an upper surface and a lower surface which contacted the casting surface, both the upper and lower surfaces in the as-cast condition being smooth and uniform, edges of the strip being substantially flat and smooth, the as-cast thickness ranging from 0.010 to 0.100 inch, and the internal structure having relatively small columnar cells oriented in the direction from one strip surface to the other strip surface.

4,678,720

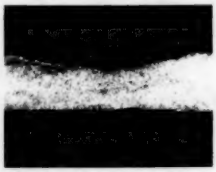
SILVER-COPPER-TITANIUM BRAZING ALLOY

Shih C. Hsu, Wellesley, and Ramas V. Raman, Framingham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 688,679, Jan. 4, 1985, abandoned. This application Aug. 11, 1986, Ser. No. 895,525

Int. Cl.[4] **B23K** *35/34, 35/362;* **C22C** *1/02, 5/08*

U.S. Cl. 428—606 **9 Claims**



1. A silver-copper-titanium brazing foil preform comprising from about 10 to about 50 weight percent copper, from about 0.1 to about 9.5 weight percent titanium and the balance silver; said preform having very fine and uniformly distributed grains;

said foil preform having been fabricated by heating titanium, silver and copper in a crucible to form a melt; said crucible having had an orifice, said crucible having been positioned above a revolving chill wheel; said melt having been ejected upon said wheel by an overpressure of a gas to form a ductile foil from about 0.0008 inches to about 0.006 inches thick; and said ductile foil having been punched to form said brazing foil preform.

4,678,721

MAGNETIC RECORDING MEDIUM

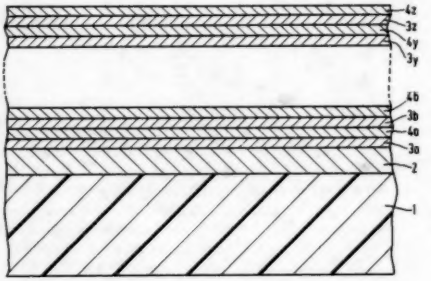
Friedrich J. A. den Broeder; Henricus J. G. Draaisma, and Alexander Kahle, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,483

Claims priority, application Netherlands, Apr. 7, 1986, 8600869

Int. Cl.[4] **B21C** *37/00*

U.S. Cl. 428—607 **12 Claims**



1. A magnetic recording medium comprising:

a nonmagnetic substrate; and

a thin magnetic layer on the substrate, said magnetic layer having a perpendicular anisotropy, said magnetic layer comprising alternating layers of Pd and Co;

characterized in that in the magnetic layer:

the thickness of each Pd layer is between 0.2 and 2.0 nm; and

each layer of Co consists of at least a monolayer of Co atoms but has a thickness less than 0.3 nm.

4,678,722

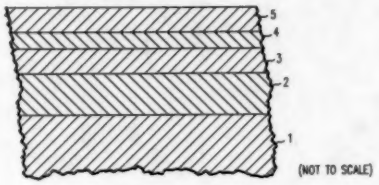
RECORD MEMBER WITH METALLIC ANTIFRICTION OVERCOAT

Uri Cohen, 765 San Antonio Rd., Unit 53, Palo Alto, Calif. 94303

Continuation-in-part of Ser. No. 670,135, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 405,062, Aug. 4, 1982, abandoned. This application Jun. 21, 1985, Ser. No. 747,612

Int. Cl.[4] G11B 5/72

U.S. Cl. 428—642 28 Claims



1. A magnetic recording member comprising:

a substrate;

a magnetic film deposited on said substrate; and

an antifriction metallic overcoat over said magnetic film for presenting a soft, low-friction metallic surface for contacting a movable member, said overcoat having a thickness greater than 50 Å and less than 10,000 Å and comprising an alloy, said alloy comprising silver and a metal selected from the group consisting of cadmium, indium, tin and lead.

4,678,723

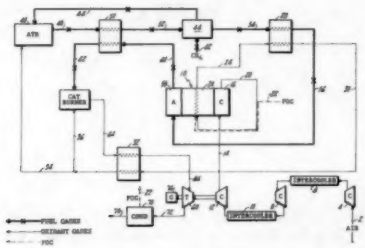
HIGH PRESSURE LOW HEAT RATE PHOSPHORIC ACID FUEL CELL STACK

Ronald J. Wertheim, Hartford, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Nov. 3, 1986, Ser. No. 926,164

Int. Cl.[4] H01M 8/04

U.S. Cl. 429—17 7 Claims



1. A high pressure phosphoric acid fuel cell stack assembly comprising:

(a) a stack of fuel cells for producing electricity, said stack including cathode means, anode means, and heat exchange means;

(b) means for delivering pressurized air to said cathode means;

(c) means for delivering a hydrogen rich fuel gas to said anode means for electrochemically reacting with oxygen in the pressurized air to produce electricity and water;

(d) first conduit means connected to said cathode means for exhausting a mixture of oxygen-depleted air and reaction water from said cathode means;

(e) second conduit means connected to said first conduit means for delivering a water fog to said first conduit means for entrainment in said mixture of oxygen-depleted air and reaction water to form a two phase coolant having a gaseous air phase and an entrained water droplet phase;

(f) means for circulating said coolant to said heat exchange means to cool said stack solely through vaporization of said water droplet phase in said heat exchange means whereby a mixed gas exhaust of air and water vapor is exhausted from said heat exchange means; and

(g) means for heating said mixed gas exhaust and delivering the heated mixed gas exhaust at reformer reaction temperatures to an autothermal reformer in said stack assembly for autothermal reaction with a raw fuel to form said hydrogen rich fuel.

4,678,724

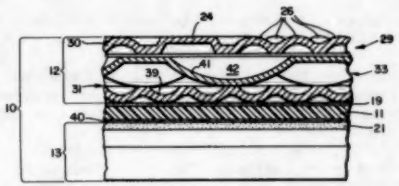
FUEL CELL BATTERY WITH IMPROVED MEMBRANE COOLING

James F. McElroy, Hamilton, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 391,800, Jun. 23, 1982. This application Apr. 19, 1984, Ser. No. 601,743

Int. Cl.[4] H01M 2/00, 8/12

U.S. Cl. 429—34 1 Claim



1. A fuel cell battery comprising at least two adjoining fuel cells of the type including a membrane having anodes and cathodes in intimate electrical contact therewith:

(a) means to supply fuel and oxygen gases to the anode and cathode electrode of each cell,

(b) means to maintain the anode side of the membrane cooler than the cathode side, and cooler than it would normally be to minimize anode side drying of the membrane, consisting of electrically conductive bipolar separators positioned between electrodes of adjacent cells opposite sides of said separators having projections contacting said electrodes, said bipolar separators including means for differentially cooling opposite sides of said separators, the cooler side of said bipolar nonperforated separator contacting the anode in contact with the membrane of one cell and the other side contacting cathode of the adjacent cell whereby an increased temperature differential is established across each membrane.

4,678,725

HERMETICALLY SEALED STORAGE BATTERY

Yoichi Kikuchi, Fujisawa, and Kenji Kobayashi, Oiso, both of Japan, assignors to Matsushita Electric Industrial Co., Inc., Osaka, Japan

PCT No. PCT/JP84/00538, § 371 Date Jun. 30, 1986, § 102(e) Date Jun. 30, 1986, PCT Pub. No. WO86/03060, PCT Pub. Date May 22, 1986

PCT Filed Nov. 8, 1984, Ser. No. 882,982

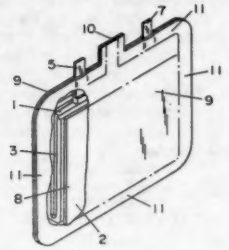
Claims priority, application Japan, May 11, 1983, 58-83108

Int. Cl.[4] H01M 2/12

U.S. Cl. 429—53 8 Claims

1. A hermetically sealed storage battery comprising a plate group consisting of a positive plate, negative plates and a separator separating said plates from each other, an electrolyte retained by said plate group, a housing constituted by an electrolyte-resistant, heat-weldable synthetic resin film or sheet, a sealing portion formed in the portion of said housing that surrounds the periphery of said housing, a pair of terminal

pieces protruding out through said sealing portion, and a safety valve formed in a portion of said sealing portion, said sealing portion being constituted by a heat-welded portion formed by welding members of said resin film or sheet together, and said



safety valve having an adhesion portion formed by members of said resin film or sheet laid one on the other whereby when the internal pressure of the cell becomes excessive, the gas in the cell forces open said adhesion portion to escape out.

4,678,726

MULTICELL ELECTRIC STORAGE BATTERY WITH COMBINED MEANS FOR WASTE-GAS DRYING AND FLAME-PROTECTION

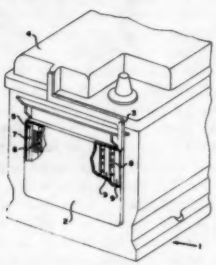
Eckart Buder, Neustadt; Hans-Ulrich Metz, Bad Münder, and Dieter Übermeier, Hanover, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 821,497

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3503014

Int. Cl.[4] H01M *2/12*

U.S. Cl. 429—88 **20 Claims**



1. In a multicell electric battery comprised of a block casing and cover defining a plurality of individual cells which are capable of releasing gases via a common gas canal passing through the block cover of the battery to the outside, the improvement wherein the gas canal communicates with a container located on an outer side of the block casing of the battery, and wherein the container is internally subdivided into at least two spaces in the direction of gas flow including a first space containing means for acid separation and collection, for removing moisture from the gases generated during overcharging, and a second space provided with flame protection means.

4,678,727

SODIUM-SULFUR CELL BLOCK

Mitsuo Kawakami, and Hiroyuki Kawamoto, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

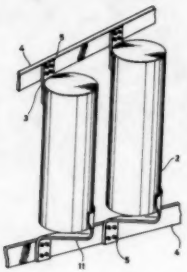
Filed Nov. 25, 1985, Ser. No. 802,194

Claims priority, application Japan, Nov. 28, 1984, 59-251378

Int. Cl.[4] H01M *2/30*

U.S. Cl. 429—104 **11 Claims**

1. A sodium-sulfur cell block having a plurality of sodium-sulfur cells, both ends of each cell in the direction of its long axis, being firmly attached to common terminals, characterized in that at least one end of said sodium-sulfur cell in said direction of the long axis is secured to one of said common terminals by a cell terminal comprising an elongated member, one end of said elongated member being secured to said one common terminal and the other end of said elongated member being



secured to said cell, said elongated member projecting as a cantilever in a direction trarsverse to the long axis of a cell so that said other of the elongated member is spaced from said one common terminal to form a cantilever region extending between a portion of said one common terminal secured to one end of said elongated member and a portion of said cell secured to the other end of said elongated member.

4,678,728

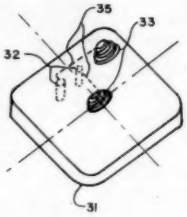
INTERCONNECTOR DEVICE

John A. Christopulos, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 17, 1986, Ser. No. 909,364

Int. Cl.[4] H01M *2/20*

U.S. Cl. 429—121 **2 Claims**



1. An interconnector device that allows a lithium-type battery to be substituted for a Leclanche battery, said Leclanche battery being of predetermined dimensions and having a pair of coil spring connection terminals at predetermined locations on the top surface thereof, said lithium battery being of different predetermined dimensions than said Lechanche battery and having a pair of female connection sockets positioned at a predetermined off-center location on the top surface thereof, the locations of said coil spring terminals and said connection sockets of the respective batteries being at substantially different non-matching positions, comprising a thin flat wafer of non-conductive material of predetermined size and configuration, said wafer having the same cross-section dimensions as said Leclanche battery, a pair of prongs on the underside surface of said wafer and at locations which correspond to the locations of female connection sockets of said lithium battery, the prongs being received into said female connection sockets when the interconnector device is mounted on said lithium battery, a pair of coil spring connection terminals

mounted on the opposite or top surface of said wafer and having a configuration which matches that of the connection terminals of said Leclanche battery and being positioned at locations which corresponds to the locations of the coil spring connection terminals of the Leclanche battery, and a pair of electrical conductors plated on the underside surface of said wafer for respectively interconnecting the pair of prongs and the pair of coil spring connection terminals in parallel.

4,678,729

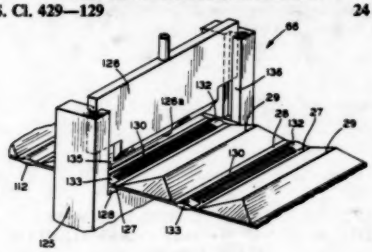
SEPARATOR BASKET PREFORMS FOR PRIMARY CELLS AND METHODS OF FORMING AND INSERTING SAME

R. D. Simonton, Fremont; John D. Cattano, Castalia, and Robert K. Mason, Gibsonburg, all of Ohio, assignors to Fremont Special Machine Co., Inc., Fremont, Ohio

Continuation-in-part of Ser. No. 707,887, Mar. 4, 1985, Pat. No. 4,618,546. This application Jun. 9, 1986, Ser. No. 871,867

Int. Cl.[4] H01M *2/18*; B65H *20/00*

U.S. Cl. 429—129 **24 Claims**



1. An elongate strip of a plurality of preforms for primary cell separator baskets comprising first and second walls of ionically permeable sheet material, said second wall overlaying said first wall; a joint between said first and second walls along one longitudinal margin of said strip; a bond for each of said preforms extending transverse of said strip between said first and second walls; and at least one of said walls having a detent associated with each preform of said strip to facilitate the feed of said strip in processing said preform.

4,678,730

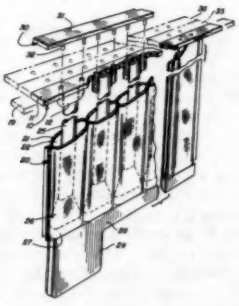
TUBULAR PLATE ELECTRODE SLURRY FILLING PROCESS AND APPARATUS FOR LEAD-ACID CELLS

Mark L. Eggers, Schaumburg, Ill., assignor to KW Battery Company, Skokie, Ill.

Filed Dec. 4, 1985, Ser. No. 804,496

Int. Cl.[4] H01M *4/76*

U.S. Cl. 429—140 **18 Claims**



1. A tubular plate electrode foot for installation on a tubular plate electrode assembly comprising a plurality of lead spines extending from a conductive bar, each said spine enveloped by a porous tubular sheath, said foot comprising:

a generally rectangular base portion;

a plurality of projections extending from said base portion, the cross-sectional configuration of each said projection corresponding to the cross-sectional configuration of said porous tubular sheaths, and each said projection provided with a spine recess conforming to the configuration of said spines; and

a plurality of slurry access ports penetrating said foot, with at least one said slurry access port in each said projection.

4,678,731

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER HAVING BARRIER LAYER COMPRISING MICROCRYSTALLINE SILICON CONTAINING HYDROGEN

Shuji Yoshizawa, Tokyo; Wataru Mitani; Mariko Yamamoto, both of Yokohama; Akira Sanjoh, Aichi, and Tatsuya Ikezue, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 23, 1986, Ser. No. 877,519

Claims priority, application Japan, Jun. 25, 1985, 60-138207; Jun. 25, 1985, 60-138208; Jun. 25, 1985, 60-138209; Jun. 25, 1985, 60-138214

Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—65 **18 Claims**

1. An electrophotographic photosensitive member comprising:

a conductive substrate;

a barrier layer provided on the conductive substrate, at least part of said barrier layer being formed of microcrystalline silicon containing hydrogen, an element included in group III or V of the periodic table, and at least one element selected from carbon, oxygen, and nitrogen; and

a photosensitive layer provided on the barrier layer, at least part of said photosensitive layer being formed of microcrystalline silicon.

4,678,732

METHOD FOR MANUFACTURE OF PHOTO-SEMICONDUCTOR

Tadashi Sekiya, Nagoya; Akihiro Tsuzuki, Toyota, and Yasuyoshi Torii, Nagoya, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,393

Claims priority, application Japan, Sep. 12, 1984, 59-191115

Int. Cl.[4] H01B *1/06*

U.S. Cl. 430—136 **2 Claims**

1. A rapid quenching method using roller for the manufacture of a photo-semiconductor capable of decreasing the electric resistance thereof by exposure to a light and exhibiting the smallest magnitude of eletric resistance to the light of a wavelength in the neighborhood of 500 nm, which method comprises molding, firing, and thermally fusing one powdered member selected from the group consisting of $95Bi_2O_3.5SiO_2$, $97.5Bi_2O_3.2.5V_2O$, $95–97.5BiO_2.2.5–5Nb_2O_5$, $95–97.5-BiO_2.2-.5–5Ta_2O_5$, $95Bi_2O_3.5MoO_3$, $95Bi_2O_3.5WO_3$, $95Bi_2O_3.5ZrO_2$, $6Bi_2O_3.CeO_2$, $Bi_2O_{2.9}$. $F_{0.2}$ and $95Bi_2O_3.5YF_3$, and causing the resultant metal to drop in the form of beads between two rollers kept in rotation at a high speed thereby rolling and rapidly quenching said beads and obtaining thin oriented and crystallized pieces containing sigma- or beta-type phase crystals.

4,678,733

MEMBER HAVING LIGHT RECEIVING LAYER OF A-SI: GE (C,N,O) A-SI/SURFACE ANTIREFLECTION LAYER WITH NON-PARALLEL INTERFACES

Keishi Saitoh, Ibaraki; Masahiro Kanai, Tokyo; Tetsuo Sueda, Chofu; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Kyosuke Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,970

Claims priority, application Japan, Oct. 15, 1984, 59-214347; Oct. 16, 1984, 59-215174; Oct. 17, 1984, 59-216352; Oct. 18, 1984, 59-217261; Oct. 19, 1984, 59-218524; Oct. 20, 1984, 59-219388

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—57 57 Claims

1. A light-receiving member comprising a light-receiving layer of a multi-layer structure having a first layer comprising an amorphous material containing silicon atoms and germanium atoms, a second layer comprising an amorphous material containing silicon atoms and exhibiting photoconductivity and a surface layer having reflection preventive function provided on a substrate successively from the substrate side, said light-receiving layer containing at least one selected from oxgen atoms, carbon atoms and nitrogen atoms and having at least one pair of non-parallel interfaces within a short range and said non-parallel interfaces being arranged in a large number in at least one direction within the plane perpendicular to the layer thickness direction.

4,678,734

PROCESS FOR DEVELOPER COMPOSITIONS

John R. Laing, Rochester; C. D. Zimmer, Ontario; Deepak R. Maniar, Penfield, all of N.Y., and Meurig W. Williams, Memphis, Tenn., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1985, Ser. No. 751,821

Int. Cl.[4] G03G *9/10*

U.S. Cl. 430—137 32 Claims

1. A process for the preparation of developer compositions which comprises (1) providing carrier particles consisting of a core with an optional coating thereover; (2) introducing the carrier particles into a blending apparatus; (3) adding to the blending apparatus classified toner particles with a diameter of from about 2 microns to about 10 microns, said particles being comprised of toner resin particles, pigment particles, and a charge enhancing additive; (4) affecting blending for a period of time sufficient to enable the classified toner particles to alter the tribocharging ability of the carrier particles and become embedded therein; (5) subsequently adding to the resulting blended mixture toner particles of a diameter of from about 6 to about 18 microns, and comprised of toner resin particles, pigment particles, and a charge enhancing additive; wherein the amount of change enhancing additive in step (3) is from about 0.1 percent by weight to about 20 percent by weight and the amount of change enhancing additive present in step (5) in from about 0.1 percent by weight to about 30 percent by weight and (6) blending for a period of from about 1 minute to about 5 minutes.

4,678,735

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL WITH DEVELOPMENT INHIBITOR RELEASER

Hiroshi Kitaguchi; Masatoshi Kato; Kozo Sato; Masasi Takeuchi, and Masaaki Tsukase, all of Kanagaw, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

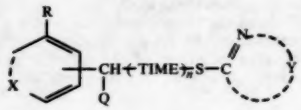
Filed Sep. 10, 1985, Ser. No. 774,427

Claims priority, application Japan, Sep. 11, 1984, 59-190173; Feb. 13, 1985, 60-26038

Int. Cl.[4] G03C *5/54, 1/34*

U.S. Cl. 430—203 9 Claims

1. A heat-developable light-sensitive material comprising a light-sensitive silver halide layer, wherein a compound represented by general formula (I) described below is in the light-sensitive silver halide layer or an image receiving layer thereof and a binder:



(I)

wherein X represents an atomic group necessary to complete a benzene ring or a naphthalene ring; R represents a group convertible to a hydroxy group or a dissociation form thereof at the time of heat-development; Y represents an atomic group necessary to complete a 5-membered or 6-membered heterocyclic group containing at least one nitrogen atom; Q represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group; TIME represents a timing group; and n represents 0 or a positive integer, wherein the heat-developable light-sensitive material further contains an organic silver salt oxidizing agent.

4,678,736

OPTICAL RECORDING MEDIA ON WHICH INFORMATION IS STORED AND METHOD OF MAKING SAME

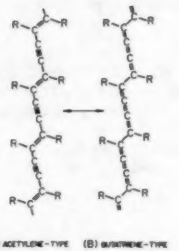
Eiichi Hanamura, and Yoshinori Tokura, both of Tokyo; Akio Takada, Tokyo; Akiro Itsubo, Mie, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1986, Ser. No. 835,183

Claims priority, application Japan, Mar. 5, 1985, 60-043886; Mar. 5, 1985, 60-043887; Mar. 5, 1985, 60-043888

Int. Cl.[4] G01D *15/14, 15/34*

U.S. Cl. 430—270 16 Claims



(A) ACETYLENE-TYPE (B) SUBSTRENE-TYPE

1. A method of making an optical recorded media for storing information optically comprising; forming a polydiacetylene thin film on a substrate; irradiating said polydiacetylene thin film with beams of radiant energy having minute diameters, said beams of radiant energy being modulated to represent information being recorded; whereby the structure of said polydiacetylene thin film is transformed to represent bits in which the information is recorded.

9. Optical recording media homing information optically stored comprising; a substrate; a thin film comprised of polydiacetylene film supported by said substrate; information bits formed on said polydiacetylene thin film by application of modulated radiant energy of minute diameter to optically store information; said polydiacetylene thin film being transformed by said radiant energy.

4,678,737

RADIATION-SENSITIVE COMPOSITION AND RECORDING MATERIAL BASED ON COMPOUNDS WHICH CAN BE SPLIT BY ACID

Arnold Schneller, Mainz; Walter Herwig, Bad Soden, and Kurt Erbes, Flörsheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 703,404, Feb. 20, 1985, abandoned. This application Nov. 25, 1986, Ser. No. 931,986

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406927

Int. Cl.[4] G03C 1/76

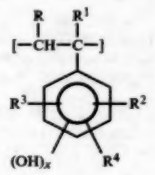
U.S. Cl. 430—270 9 Claims

1. A radiation-sensitive composition which comprises:

(a) from about 30 to 90% by weight of a polymeric binder which is insoluble in water and soluble in aqueous-alkaline solutions;

(b) from about 0.1 to 10% by weight of a compound which forms a strong acid under the action of actinic radiation; and

(c) from about 5 to 70% by weight of a compound containing at least one acid-cleavable C—O—C bond and having a solubility in a liquid developer which is increased by the action of acid, said polymeric binder comprising a copolymer comprised of (i) 40 to 90 mol-% of alkenyl phenol units represented by the formula



(I)

wherein

R denotes a hydrogen atom, a cyanide group, and alkyl group or a phenyl group,

R^1 denotes a hydrogen atom, a halogen atom, a cyanide group or an alkyl group,

R^2, R^3 and R^4 each separately denotes a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group, and

X stands for an integer from 1 to 3,

and (ii) from 10 to 60 mol-% of units of alkyl acrylate or alkyl methacrylate.

4,678,738

MANUFACTURE OF A WEAR-RESISTANT SLIDING SURFACE

Tsutomu Shimizu; Kouji Tarumoto, and Satoshi Nanba, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

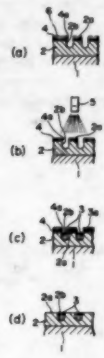
Filed Jan. 17, 1986, Ser. No. 819,681

Claims priority, application Japan, Jan. 18, 1985, 60-8210; Jan. 25, 1985, 60-13370

Int. Cl.[4] G03F 7/26; B05D 1/32, 5/08

U.S. Cl. 430—320 8 Claims

1. A process for manufacturing a member having a sliding surface, the process comprising the steps of: providing a metallic substrate having a surface covered by a photo-resist coating, forming the photo-resist coating with a pattern of at least one hard portion and a plurality of soft portions, removing the photo-resist coating at the soft portions to expose surface portions of the metallic substrate beneath the soft portions of the photo-resist coating, etching the metallic substrate with the hard portion of the photo-resist coating retained thereon to form pits in said surface portions of the metallic substrate, applying molten filler material by plasma spraying particles of molten filler material onto the surface of the metallic substrate having the hard portion of the photo-resist coating retained thereon, to fill the pits with a porous structure defined by particles of the filler material to provide an oil-retaining capability, and removing the hard portion of the photo-resist coating from the metallic substrate.



4,678,739

IMAGE FORMING METHOD INCLUDING HEATING STEP

Hiroshi Kitaguchi; Masashi Takeuchi; Kozo Sato; Masaaki Tsukase, and Masatoshi Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

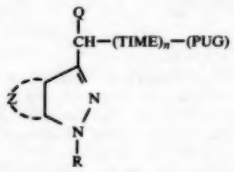
Filed Dec. 18, 1985, Ser. No. 810,149

Claims priority, application Japan, Dec. 20, 1984, 59-268925

Int. Cl.[4] G03C 5/54, 1/34, 5/26

U.S. Cl. 430—353 16 Claims

1. A method for forming an image, comprising image-wise exposing an image-forming material comprising a light-sensitive silver halide layer and heating the image-forming material in the presence of a compound represented by formula (I) and a nucleophilic agent and/or a base:



(I)

wherein R represents a hydrogen atom, or a group selected from a class consisting of groups represented by formulae (A) to (C)

(A)

(B)

(C)

wherein R^{11} and R^{12} each represents a substituted or unsubsti-

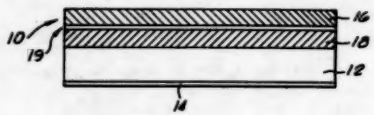
tuted alkyl group, a cyloalkyl group, a substituted or unsubstituted alkenyl group, an aralkyl group, a substituted or unsubstituted aryl group, a heterocyclic group, an alkyloxy group, an aryloxy group, an alkylthio group, an arylthio group, or a substituted or unsubstituted amino group, or R^{11} and R^{12} combine with each other to form a 5- or 6-membered ring; Q represents a hydrogen atom, an alkyl group, or an aryl group; TIME represents a timing group; PUG represents a photographically useful agent moiety; n represents 0 or an integer; and Z represents atoms forming a benzene ring.

4,678,740

METHOD FOR MAKING PHOTOGRAPHIC MATTES

James N. Catania, 7523 Hollywood Blvd., Apt. 212, Los Angeles, Calif. 90046

Filed Apr. 29, 1985, Ser. No. 728,330
Int. Cl.[4] G03C 7/02, 7/18, 7/32, 7/20
U.S. Cl. 430—356 21 Claims



1. For use in traveling matte photography, a process for making a photographic matte corresponding to an image of a foreground and a screen of a predetermined screen color, comprising:

recording a screen color separation of said image on a first layer of a photographic film;

recording a separation of a second and different color on a second layer of said film that is coextensive with said first layer; and

developing one of said layers to form a positive image and developing the other of said layers to form a negative image, whereby said images overlie and reinforce each other.

4. The process of claim 1 wherein one of said layers is subjected to color development using a dye coupler and the other of said layers is subjected to black dye-destruct development.

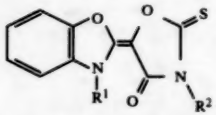
4,678,741

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Sumito Yamada, and Masaki Okazaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 630,149, Jul. 12, 1986, abandoned. This application Apr. 14, 1986, Ser. No. 851,020
Claims priority, application Japan, Jul. 12, 1983, 58-126387
Int. Cl.[4] G03C 1/06, 1/10
U.S. Cl. 430—445 23 Claims

1. A silver halide photographic material having on a support at least one hydrophilic colloid layer and at least one silver halide emulsion layer containing tabular silver halide grains having a grain diameter of at least 5 times the thickness of the grains and at least one compound represented by general formula (I)


(I)

wherein R^1 represents a methyl group and R^2 represents an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group.

4,678,742

PHOTOGRAPHIC PRINTING PAPER SUPPORT

Shigehisa Tamagawa; Tetsuro Fuchizawa, and Hisamasa Abe, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 13, 1985, Ser. No. 733,331
Claims priority, application Japan, May 11, 1984, 59-95267
Int. Cl.[4] G03C 1/76
U.S. Cl. 430—523 5 Claims

1. A photographic printing paper support comprising a base paper having a polyolefin layer formed on both surfaces thereof, said support having coated on the polyolefin layer on the back surface thereof a writing property providing layer composed of (a) inorganic pigment having an average particle diameter of from 0.1 to 2.0 μm and an oil absorption degree of 100 cc/100 g or less, and (b) an acrylic emulsion having a glass transition point of from 20° C. to 50° C., wherein the acrylic emulsion is composed of a copolymer of an acrylic ester and at least one monomer selected from styrene and methyl methacrylate and wherein said support has a photographic emulsion coated on the surface thereof opposite the back surface.

4,678,743

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

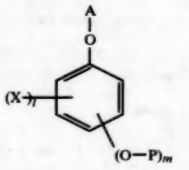
Kohzaburoh Yamada; Seiji Ichijima, and Hideo Usui, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

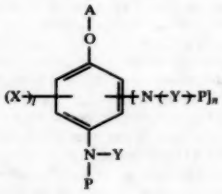
Filed Oct. 30, 1985, Ser. No. 793,064
Claims priority, application Japan, Oct. 30, 1984, 59-228642
Int. Cl.[4] G03C 1/40, 7/32
U.S. Cl. 430—551 9 Claims

1. A silver halide color photographic material comprising a support having thereon at least a light-sensitive silver halide and a coupler represented by the following general formula (I):

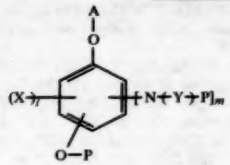
A-RED-P (I)

wherein A is a coupler residue capable of cleaving RED-P on reacting with an oxidized color developing agent, P is a group capable of releasing RED after cleavage of RED-P from A, and RED is a group capable of undergoing an oxidation reduction reaction with the oxidized color developing agent only after the cleavage of A and P, wherein said coupler represented by general formula (I) is represented by the following general formula (II), (III) or (IV):


(II)


(III)

-continued



(IV)

wherein A is the same as defined in the general formula (I);

l is 0, 1, 2 or 3;

X represents an aliphatic group, an aromatic group, a heterocyclic group, a halogen atom, an alkoxy group, an aryloxy group, an arylthio group, an alkoxycarbonyl group, a cyano group, a nitro group, a carbamoyl group, a sulfamoyl group, an acyloxy group, a heterocyclic thio group, an alkylthio group, a sulfonyl group, an aryloxycarbonyl group, an acyl group, or when l is 2, a group

where X' has the same definition as X;

Y is a hydrogen atom, an aliphatic group, an aromatic group, or a heterocyclic group, a group —COR, or a group —SO_2R wherein R represents an aliphatic group, an aromatic group or a heterocyclic group;

P is a group which is cleavable by an alkali or other additive contained in the developer;

m is 1 or 2;

n is 0, 1 or 2;

in general formula (II) the —O—P) group is in the ortho- or para-position of the phenol group, and in general formula (IV) at least one of the —O—P) group and the —N—Y—P] group is at the ortho-position or para-position of the phenoxy group, provided that in formula (IV) the P moiety of the group —O—P and the group —N—Y—P are the same or different, and the substituent P may be linked to both the O and N atoms to form a ring.

4,678,744

SPLASH-PREPARED SILVER HALIDE EMULSIONS WITH A UNIFORM PARTICLE SIZE DISTRIBUTION

Douglas L. Wilhite, and Daniel J. Mickewich, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 647,808, Sep. 6, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 821,171

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—569 **8 Claims**

1. In a process for preparing silver halide emulsions with a narrow particle size distribution and highly disordered crystals, wherein silver nitrate solution is added to a solution of halide salt dispersed in a protective colloid in a series of rapid additions, at least one of said additions containing ammonia, the improvement comprising adding monodisperse silver halide seed crystals prepared by a BDJ process to said halide salt solution prior to the addition of said silver nitrate solution.

4,678,745

PROCESS FOR PRODUCING SILVER HALIDE EMULSION AND SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING THE SAME

Sumito Yamada; Hiroyuki Mifune, and Shigeharu Urabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1985, Ser. No. 744,596

Claims priority, application Japan, Jun. 15, 1984, 59-122981

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—569 **24 Claims**

1. A process for producing a tabular silver halide emulsion using a sulfur-containing silver halide solvent that promotes growth of silver halide grains, which comprises using an oxidizing agent capable of reducing or eliminating the grain growth effect of said sulfur-containing silver halide solvent.

4,678,746

MONOCLONAL ANTIBODIES TO EPIZOOTIC HEMORRHAGIC DISEASE VIRUS ANTIGEN

Michael M. Jochim, Arvada, and Suzanne C. Jones, Lakewood, both of Colo., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1985, Ser. No. 708,613

Int. Cl.[4] G01N *33/577*; C12Q *1/70*

U.S. Cl. 435—5 **11 Claims**

1. A hybridoma which produces and secretes monoclonal antibody which is group-specific to epizootic hemorrhagic disease virus (EHDV) antigen and does not cross-react with bluetongue virus (BTV) antigen, said hybridoma further identified as ATCC HB 8378.

4,678,747

MONOCLONAL ANTIBODIES FOR DETECTION OF AN H (O) BLOOD GROUP ANTIGEN

Kenneth O. Lloyd, Bronx; Lloyd J. Old, New York, both of N.Y.; Karl-Anders Karlsson, Gothenburg, Sweden; Goran Larson, Gothenburg, Sweden; Nicklas Stromberg, Gothenburg, Sweden; Jan Thurin, Gothenburg, Sweden; Bernd R. Anger, Kreiensen, Fed. Rep. of Germany, and Herbert F. Oettgen, New Canaan, Conn., assignors to Sloan-Kettering Institute, New York, N.Y.

Continuation of Ser. No. 467,999, Feb. 18, 1983, abandoned. This application Feb. 28, 1983, Ser. No. 470,815

Int. Cl.[4] G01N *53/00*; C12N *15/00*

U.S. Cl. 435—7 **14 Claims**

1. F-3 monoclonal antibodies recognizing difucosyl-type 2-H antigen of human cells.

2. Antibody-producing hybridoma cell line characterized by the production of the antibodies claimed in claim 1.

4,678,748

PROCESS FOR THE PRODUCTION OF IMMUNOBIOLOGICAL PREPARATIONS APPLICABLE IN THE DIAGNOSIS, PREVENTION AND/OR TREATMENT OF *CANDIDA GUILLIERMONDII* INFECTIONS

Pal Sutka, and Klara Sutka, both of 60/c Meszaros u., Budapest 1016, Hungary

Filed Nov. 9, 1981, Ser. No. 319,711

Int. Cl.[4] C12P *21/00*; G01N *33/569*; C12N *1/16*; A61K *39/00*

U.S. Cl. 435—68 **6 Claims**

1. A process for producing immunobiological preparations for the diagnosis, prophylaxis and/or treatment of *Candida guilliermondii* infections comprising the steps of:

a. cultivating a *Candida guilliermondii* strain for 48–72 hours under aerobic conditions at 24°–42° C. on a culture medium containing assimilable carbon and nitrogen sources;

b. maintaining the resulting populations under aerobic conditions at 24°–42° C. for further cultivation of about 15 days

until they are bacterium-free and contain toxins of *Candida guilliermondii;*

c. separating, washing, and mechanically rupturing the bacterium-free culture;

d. separating and treating the resulting extract with a polar organic solvent; and

e. converting the resulting precipitate into an immunobiological preparation.

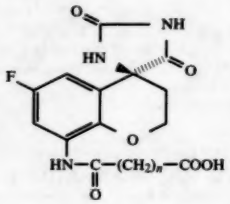
4,678,749

LIGANDS FOR AFFINITY CHROMATOGRAPHIC PURIFICATION OF ALDOSE REDUCTASE

Eric R. Larson, Mystic, and Todd W. Siegel, Milford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 13, 1986, Ser. No. 930,590
Int. Cl.[4] C12N *9/00, 9/02, 9/96*
U.S. Cl. 435—183 **13 Claims**

11. A method for purification of aldose reductase from crude extracts containing it which comprises subjecting said crude extract to affinity chromatography using an aminoalkyl carrying solid support to which a compound having the formula (I)



(I)

wherein n is 2, 3 or 4 has been coupled.

4,678,750

METHOD AND COMPOSITIONS FOR USE IN THE TREATMENT OF FIREBLIGHT

Peter A. Vandenbergh, Sarasota, Fla., and Anne K. Vidaver, Lincoln, Nebr., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Oct. 18, 1984, Ser. No. 662,065
Int. Cl.[4] C12N *9/24, 7/00;* A61K *37/48, 39/12*
U.S. Cl. 435—200 **19 Claims**

1. A composition for the treatment of fireblight in plants which is caused by an *Erwinia amylovora* having the characteristic of producing a capsular polysaccharide responsible for the fireblight in the plants which comprises in admixture:

(a) a phage which lyses the *Erwinia amylovora;* and

(b) an isolated polysaccharide depolymerase enzyme produced by a phage which lyses the *Erwinia amylovora,* wherein the composition contains at least 10^6 pfu of the phage per gram of the composition.

12. The method of treatment of fireblight in affected plants caused by an *Erwinia amylovora* having the characteristic of producing a capsular polysaccharide responsible for the fireblight in the plants which comprises applying to the plants an effective amount of a composition which comprises:

(a) a phage which lyses an *Erwinia amylovora;* and

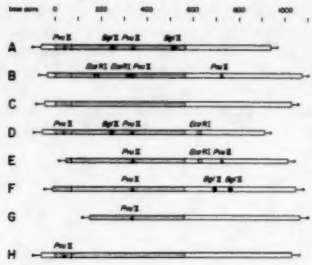
(b) a depolymerase enzyme for depolymerizing the polysaccharide produced by a phage which lyses the *Erwinia amylovora.*

4,678,751

HYBRID HUMAN LEUKOCYTE INTERFERONS

David V. Goeddel, Burlingame, Calif., assignor to Genentech, Inc., San Francisco, Calif.

Continuation of Ser. No. 305,657, Sep. 25, 1981, Pat. No. 4,456,748, which is a continuation of Ser. No. 237,388, Feb. 23, 1981, Pat. No. 4,414,150, and Ser. No. 205,579, Nov. 10, 1980, abandoned. This application Jun. 20, 1984, Ser. No. 623,061
Int. Cl.[4] C12N *1/00, 15/00, 5/00, 5/02, 1/20;* C12P *21/00, 21/02, 21/04, 19/34;* C12R *1/13, 1/19;* C07H *21/04*
U.S. Cl. 435—243 **2 Claims**



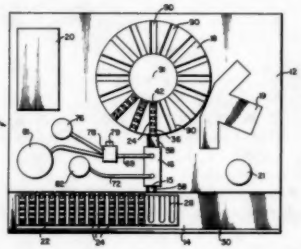
1. A replicable plasmidic expression vehicle capable, in a transformed microorganism, of expressing a polypeptide of approximately 165–166 amino acids, the amino acid sequence of said polypeptide comprising, in sequence, discrete subsequences corresponding in amino acid identity and number to sub-sequences of different, naturally occurring leukocyte interferons, the amino acid sequence of said polypeptide differing in overall sequence from the amino acid sequence of naturally occurring leukocyte interferons.

4,678,752

AUTOMATIC RANDOM ACCESS ANALYZER

Gale H. Thorne, Bountiful; Charles V. Owen, Highland; Randall W. Smith, Sandy; Ruth D. Goldberg, Salt Lake City; Scott D. Miles, Orem, and Michael J. Claus, Salt Lake City, all of Utah, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 18, 1985, Ser. No. 799,238
Int. Cl.[4] C12M *1/34*
U.S. Cl. 435—291 **37 Claims**



1. An automated apparatus for analysis of samples comprising:

an introduction station for the placement of a rack containing a plurality of reagent packages, each package having a plurality of receptacles at least one of which includes a sample liquid, and at least one of which includes a liquid reagent for forming a reaction mixture with said sample liquid, said introduction station including a platform for

holding an elongate rack having a plurality of slots aligned in substantially parallel arrangement along the longitudinal axis of said rack, said reagent packages being removably positioned in said slots;

a liquid transfer station for the transfer of liquid contained in one or more receptacles of a reagent package among the different receptacles of said one reagent package so that a reaction mixture may be formed;

an incubation storage area for holding a plurality of reagent packages which have passed through said liquid transfer station;

a shuttle system for moving said rack so that each package therein is positionable adjacent said liquid transfer station and for removing one of said packages at a time from the rack and moving it into said transfer station and into said incubation storage area, said shuttle system being further operative to move individual packages from the storage area into said transfer station and into said rack in the introduction station; and

a detector for analyzing the reaction mixture contained in one of the receptacles of any of said packages for determining a characteristic of the sample.

4,678,753
BLOOD-CULTURE FLASK WITH INTEGRATED SUBCULTURE

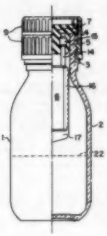
Hans D. Hempel, Mainaschaff; Jürgen Horn, Egelsbach; Wilfried Rothermel, Dietzenbach; Hans H. Sonneborn, Heusenstamm; Michael Becker, Offenbach, and Ullrich Müller, Rüsselsheim, all of Fed. Rep. of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt/M, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,908

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 8425171[U]

Int. Cl.[4] C12M *1/24*

U.S. Cl. 435—296 **8 Claims**



1. A blood-culture flask with an integrated subculture comprising a flask **2** that can be filled with a liquid nutrient solution and has a neck **3** with an outside thread **5** and an upper edge **4**, a support **6** for a solid culture medium, a resilient stopper **7** with an edge **8** that projects at one end, and a screw cap **9** comprising a bottom **10** that is open above and below and has an inside thread **11** with an inside flange **12** above the inside thread and a top **13** that is open below, the inside thread **11** being dimensioned so that it can be screwed down over the outside thread **5** on the neck **3** of the flask in such a way that the flange **12** is above the outside thread **5** and is below the upper edge **4** of the neck **3** when screwed on, the resilient stopper **7** being positioned inside the botton **1** of the screw cap **9** so that the bottom surface of its resilient projecting edge **8** comes to rest against the flange **12** above the outside thread when not screwed on and its lower sectin is dimensioned so that it can be introduced tightly into the neck **3** of the flask, the support **6** having two surfaces that can be coated with a solid culture medium on opposite sides and which are provided with retainer surfaces **16** on at least the two longitudinal sides, overlapping the solid culture medium, the support being fastened to the bottom of the resilient stopper **7**, and extending in use only over part of the height of the flask **2**, the top **13** of the screw cap in assembled state forcing the resilient projecting edge **8** of the stopper **7** tightly against the upper edge **4** of the neck **3** of the flask.

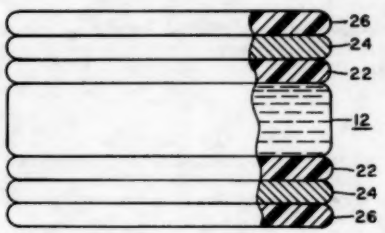
4,678,754
LIQUID CLINICAL CONTROL STANDARD, AND REAGENT PRODUCTS

Michael K. Hoskins, Orange, Calif., assignor to Ciba Corning Corp., Medfield, Mass.

Division of Ser. No. 740,861, Jun. 3, 1985, Pat. No. 4,643,976. This application Nov. 3, 1986, Ser. No. 926,467

Int. Cl.[4] G01N *31/00*

U.S. Cl. 436—15 **3 Claims**



1. A process for making stable clinical protein-based liquid solutions comprising simultaneously filling a storage pouch, having a reservoir and connected to the reservoir at least one heat-sealed filling inlet and at least one heat-sealed dispensing outlet, with a clinical protein-based liquid having a temperature below its denaturation point and an inert gas having a temperature below ambient temperature which is sufficient to cool either the liquid or the pouch such that the heat sealing of the inlet and the outlet does not substantially denature the clinical proteins in the liquid.

4,678,755
AUTOMATIC CHEMICAL ANALYZER

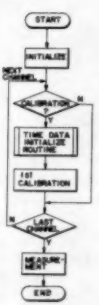
Hiroo Shinohara, Ootawara, and Toshiaki Imai, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1985, Ser. No. 760,148

Claims priority, application Japan, Jul. 30, 1984, 59-161377

Int. Cl.[4] G01N *35/00*

U.S. Cl. 436—43 **8 Claims**



1. In an automatic chemical analyzer having means for containing a sample to be analyzed, means for forming a reaction solution comprised of a mixture of the sample and a reagent corresponding to an analysis item, and means for analyzing the analysis item in the above mixture and wherein an output is provided in response to a quantitative analysis result obtained

by comparing a measured reaction of said solution to a calibration curve corresponding to a respective analysis item, the improvement of:

means for storing the identity of a plurality of analysis items;

means for storing data indicating the time of a previous calibration of the calibration curve for each of the identified analysis items;

means for storing data corresponding to a predetermined time interval following the calibration of each calibration curve, said time interval corresponding to the time from a previous calibration that the calibration curve can be reliably substantially effective for analysis;

control means including counting means for checking periodically the time interval remaining for each previous calibration of the calibration curve for a respective analysis item; and

means governed by said counting means for outputting data representative of the reliability of each checked calibration curve.

4,678,756

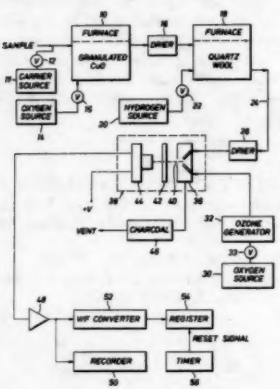
CHEMILUMINESCENT SULFUR DETECTION APPARATUS AND METHOD

Robert E. Parks, Houston, Tex., assignor to Antek Instruments, Inc., Houston, Tex.

Division of Ser. No. 232,891, Feb. 9, 1981, Pat. No. 4,352,779. This application Jun. 9, 1982, Ser. No. 386,712

Int. Cl.[4] G01N *21/76*

U.S. Cl. 436—123 **11 Claims**



1. A method for determining the total chemically combined sulfur in a specimen which comprises the steps of:

(a) introducing the specimen in the presence of a carrier gas into a furnace operated at an elevated temperature above 300° C. into the presence of a metal oxide to convert at least a portion of the chemically bound sulfur into oxides of sulfur;

(b) thereafter passing the specimen from the furnace through a dryer to remove at least a portion of the water therein;

(c) after water removal, exposing the specimen to a hydrogen rich atmosphere within a furnace at an elevated temperature to convert the specimen including chemically combined sulfur into hydrogen sulfide;

(d) exposing the hydrogen sulfide produced from step (c) to ozone to form a chemiluminescent reaction; and

(e) measuring the magnitude of the chemiluminescent reaction by observing quanta of light to obtain the quantity of chemically combined sulfur in the specimen.

4,678,757

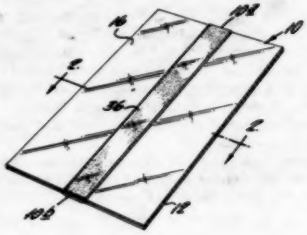
DEVICE AND METHOD FOR WHOLE BLOOD SEPARATION AND ANALYSIS

Myron C. Rapkin, Cupertino; Ronald J. Schoengold; David R. Shockey, both of San Jose, and Pierre C. Van Rysselberghe, Palo Alto, all of Calif., assignors to SmithKline Diagnostics, Inc., Sunnyvale, Calif.

Filed Apr. 11, 1985, Ser. No. 722,231

Int. Cl.[4] G01N *1/18, 21/77, 31/22*

U.S. Cl. 436—169 **6 Claims**



1. A test device for separating the fluid portion from whole blood and detecting soluble components in whole blood which comprises a first impermeable carrier having applied thereon a sugar and a second impermeable carrier having incorporated thereon a test reagent specifically reactable with a component to be detected, said first and second carriers being affixed to one another substantially along their entire juxtaposed peripheral edges defining an opening there-between and so layered that the sugar and reagent are in contiguous facing relationship, wherein said opening and carriers permit capillary and longitudinal transport of the blood.

5. A method for separating whole blood into fluid and cellular fractions which comprises applying the blood to the device of claim 1 whereby the cellular fraction remains in close proximity to the site of contact and the fluid fraction migrates in a longitudinal fashion away from said site.

4,678,758

POROUS CERAMIC FILTER BODY AND MANUFACTURING METHOD THEREFOR

Konrad Kampfer, Thayngen; Wolfhart Rieger, Buch; Ludwig Gauckler, and Marco Dellapina, both of Schaffhausen, all of Switzerland, assignors to Swiss Aluminum Ltd., Chippis, Switzerland

PCT No. PCT/CH84/00012, § 371 Date Oct. 2, 1984, § 102(e) Date Oct. 2, 1984, PCT Pub. No. WO84/03056, PCT Pub. Date Aug. 16, 1984

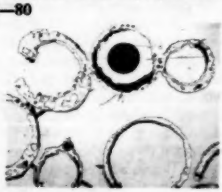
PCT Filed Jan. 27, 1984, Ser. No. 668,724

Claims priority, application Switzerland, Feb. 11, 1983, 809/83

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] C04B *38/08;* **B01D** *39/20*

U.S. Cl. 501—80 **15 Claims**



1. Cermaic, open, porous body for the filtration of metals which comprises a sintered porous body having a macroscopically homogeneous structure and a temperature resistance of at least 1600° C. with a linear coefficient of thermal expansion lying between 3×10^{-6} and 7×10^{-6}/°C., wherein said porous

body is formed from (A) hollow fused spherical particles having at least one void of minimum one refractory material in homogeneous distribution, and (B) another refractory material different from the refractory phase material of the spherical particles in powder form as binding phase which combines during sintering at high temperature by chemical reaction with the spherical particles to form a still further refractory phase (C) which is more refractory than said binding phase and is homogeneously distributed throughout the porous body, wherein after the sintering temperature treatment said porous body retains a macroscopically homogeneous structure without a macroscopic shrinkage.

4,678,759

ZrB_2 COMPOSITE SINTERED MATERIAL

Otojiro Kida, and Yutaka Segawa, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 749,829, Jun. 28, 1985. This application Oct. 7, 1986, Ser. No. 916,225

Claims priority, application Japan, Jul. 10, 1984, 59-141400; Aug. 14, 1984, 59-168812; Sep. 14, 1984, 59-191815

Int. Cl.[4] C04B *35/56, 35/58*

U.S. Cl. 501—92 **6 Claims**

1. A ZrB_2 composite sintered material consisting essentially of (a.) from 1 to 12% by weight of SiC, (b.) from 1 to 49% by weight of BN, the rest (c.) being substantially ZrB_2, provided that the total amount of SiC and BN is from 2 to 50% by weight.

4,678,760

METHOD OF FORMING A SUBSTANTIALLY INTERWOVEN MATRIX CONTAINING A REFRACTORY HARD METAL AND A METAL COMPOUND

Siba P. Ray, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 604,913, Apr. 27, 1984, which is a continuation-in-part of Ser. No. 423,673, Sep. 27, 1982, Pat. No. 4,454,015. This application Oct. 21, 1985, Ser. No. 789,435

Int. Cl.[4] C04B *35/00, 35/58, 35/10, 35/46*

U.S. Cl. 501—96 **23 Claims**

FIRST REACTANT COMPRISING METAL OR METAL COMPOUND
SECOND REACTANT COMPRISING METALLOID OR METALLOID COMPOUND
REACTANT
LOCALLY INITIATE SELF-PROPAGATING REACTION
FORM A SUBSTANTIALLY INTERWOVEN MATRIX OF REFRACTORY HARD METAL AND A METAL COMPOUND

1. In a process wherein a first reactant comprising one or more metals or metal compounds exothermically reacts with at least one or more metals or metal compounds in the presence of a third reactant to form a substantially interwoven matrix of a conductive material and an insulating material; the improvement which comprises locally applying, to a selected region of a shaped body formed from a mixture of said reactants, sufficient energy to initiate said exothermic reaction which propagates throughout the remainder of said body to form said interwoven matrix.

4,678,761

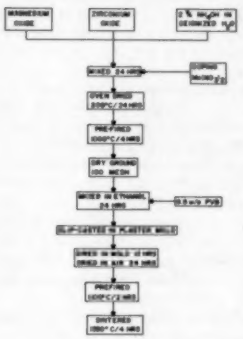
SINTERABLE AND STRENGTHENED MAGNESIUM OXIDE CERAMIC MATERIALS

Anil Virkar, and Thomas C. Yuan, both of Salt Lake City, Utah, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 665,912, Oct. 29, 1984. This application Oct. 29, 1985, Ser. No. 792,479

Int. Cl.[4] C04B *35/48*

U.S. Cl. 501—104 **19 Claims**



1. A sintered ceramic body comprising magnesium oxide and a very minor amount of a metal oxide having the formula AO_x wherein A is a metal selected from the class consisting of manganese and iron which has a valence state greater than +2 and has an ionic radius substantially similar to the magnesium ion and x is a number having a value greater than one-half the valence state of A.

4,678,762

VERY SMOOTH AND FLAT POLYCRYSTALLINE ALUMINA SUBSTRATES FROM DIRECT FIRING

Anil K. Agarwal, Camarillo, Calif., and Robert A. Hay, Dudley, Mass., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 698,219, Feb. 4, 1985, abandoned. This application Oct. 15, 1985, Ser. No. 787,240

Int. Cl.[4] C04B *35/10*

U.S. Cl. 501—127 **10 Claims**

1. An as-fired thin, flat, water-impermeable sintered polycrystalline ceramic body consisting essentially of at least 99.5% by weight alpha-alumina said ceramic body having a density of at least 3.9 Mg/m^3, and an average surface roughness on both major surfaces not greater than 44 nm said alumina being made from generally uniformly sized particles such that 98% have a size of less than 1. micron and more than 90% are within a size range of about 0.3 microns or less.

5. In a process for the production of thin, flat, water-impermeable sintered polycrystalline ceramic substrates by tape casting a slurry of ceramic powder, drying to give a greenwave substrate, and firing to give a coherent ceramic substrate, the improvement wherein the ceramic powder used to prepare said slurry is processed to obtain a narrow particle size dispersion such that the ceramic powder in such slurry has at least 90% of its particles within a size range not broader than 0.3 microns and also 98% of its particles are less than 1 micron in size.

4,678,763

METHOD FOR RECLAIMING HEAT-DAMAGED CATALYSTS

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 631,352, Jul. 16, 1984, abandoned. This application Jan. 17, 1986, Ser. No. 819,944

Int. Cl.[4] B01J *29/38, 38/66, 29/28, 38/48*

U.S. Cl. 502—26 9 Claims

1. A method for reclaiming an unbound catalyst that because of heat damage has lost at least 10% of its activity for cracking normal hexane, said catalyst comprising a zeolite having a Constraint Index of 1 to about 12 and a silica-to-alumina ratio of about 20:1 to less than about 500:1, said damaged catalyst being further characterized by a measurable increase in hexane cracking activity when base exchanged at about 80° C. with an ammonium salt followed by conversion to the hydrogen form, said method consisting essentially of:

contacting said heat-damaged catalyst with liquid water at a temperature of about 80° C. to about 370° C. for about 1 to 100 hours, said combination of temperature and time being effective to augment said measurable increase in hexane cracking activity by at least about 5 alpha units; and,

converting said contacted catalyst to the ammonium form by ion exchange with an ammonium salt at a temperature of about 50° C. to about 100° C.

3. The method described in claim 1 wherein said contacting is at a temperature of about 80° C. to 150° C.

5. The method described in claim 1 wherein said zeolite is ZSM-5.

4,678,764

REACTIVATION OF NOBLE METAL-ZEOLITE CATALYSTS

Quang N. Le, Cherry Hill, N.J.; Ying-Yen P. Tsao, Langhorne, Pa., and Stephen S. Wong, Medford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 21, 1985, Ser. No. 800,581

Int. Cl.[4] B01J *29/38, 23/96, 38/66, 38/60*

U.S. Cl. 502—26 24 Claims

1. A method for reactivating a sulfur oxide-poisoned, oxidatively regenerated, noble metal-containing zeolite catalyst whereby dispersion of said noble metal is enhanced, which comprises removing at least some of said sulfur oxides from said catalyst by contacting said catalyst with an aqueous solution containing a Bronsted acid compound having a dissociation constant ranging from about 1×10^{-14} to about 2×10^{-1} which has been added such that the resulting aqueous solution has a pH below about 7 and thereafter exposing said catalyst to noble metal dispersing conditions which comprise contacting said catalyst with halogen containing gas containing 2 to 20 torr chlorine, 200 to 4000 torr oxygen and above 0 to 50 torr water.

2. The method of claim 1 wherein said compound is an ammonium salt.

4. The method of claim 1 wherein said compound is selected from the group consisting of nitric acid, carbonic acid and hydrogen peroxide.

4,678,765

CATALYTIC CRACKING CATALYSTS FOR HIGH OCTANE GASOLINE PRODUCTS

Robert L. Chiang, Oakland, N.J., and Mark T. Staniulis, Peekskill, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 3, 1984, Ser. No. 657,482

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—65 7 Claims

1. A cracking catalyst comprising a zeolitic aluminosilicate having a mole ratio of oxides in the dehydrated state of

$$(0.85\text{–}1.1)\ M_{2/n}O:Al_2O_3:xSiO_2$$

wherein "M" is a cation having a valence of "n"; "x" has a value greater than 6.0 to about 7.0; has an x-ray powder diffraction pattern having at least the d-spacings of Table A; has extraneous silicon atoms in the crystal lattice in the form of framework SiO_4 tetrahedra; an inorganic oxide matrix; has an effective amount between greater than zero to less than 5 weight percent, based on the weight of the aluminosilicate employed in the catalyst, expressed as the oxide, of at least one rare earth cation selected from the group consisting of cerium, lanthanum, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium; and less than 1.2 weight percent Na_2O based on the wright of the aluminosilicate employed in the catalyst.

4,678,766

ENHANCEMENT OF SHAPE SELECTIVITY OF ZEOLITES

Edward J. Rosinski, Pedricktown, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 543,549, Oct. 19, 1983, abandoned, which is a continuation of Ser. No. 543,547, Oct. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 355,420, Mar. 8, 1982, abandoned. This application Feb. 22, 1985, Ser. No. 704,694

Int. Cl.[4] B01J *29/38*

U.S. Cl. 502—85 25 Claims

1. A method for enhancing the selectivity for dewaxing of a porous crystalline zeolite selected from the group consisting of ZSM-5, ZSM-35, and ZSM-38 having a silica to alumina mol ratio greater than about 10 and a crystal size ranging from about 2 to 5 microns which comprises:

(a) calcining said zeolite between the temperature of about 300° C. and about 900° C.;

(b)impregnating said calcined zeolite at 80° to 150° C. with an aqueous solution of ammonium fluoride which yields available fluoride ions to provide between about 2.0 to about 30% by weight of elemental fluorine in the final treated product of (e);

(c) calcining said fluoride treated zeolite at a temperature between about 300° C. and about 900° C.;

(d) contacting said calcined, fluoride treated zeolite with an aqueous solution of an ammoniun salt; and

(e) calcining said ammonium treated zeolite.

9. A method for enhancing the selectivity for dewaxing of a crystalline zeolite having a silica-to-alumina mol ratio greater than 10, a crystal size ranging from about 2 to 5 microns and selected from the group consisting of ZSM-5, ZSM-35, and ZSM-38, which method comprises:

contacting said zeolite with an amount of aqueous solution of ammonium fluoride, said amount containing sufficient salt to provide between about 2.0 to about 30 percent by weight of said zeolite of fluorine, said contacting being for a time and at a temperature effective to enhance said selectivity; and;

calcining said contacted zeolite at a temperature of about 300° C. to 900° C.

4,678,767

PROCESS FOR PRODUCING A CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Mamoru Tachikawa; Satoshi Ueki; Masato Sakuma, all of Saitama; Chihiro Imai, Kanagawa, and Tokuo Makishima, Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1985, Ser. No. 802,659

Claims priority, application Japan, Nov. 30, 1984, 59-251740

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—104 17 Claims

14. A process for producing a catalyst component for the

polymerization of olefins which comprises contacting (a) a metal oxide of a metal selected from Groups II to IV of the Periodic Table and (b) an organomagnesium compound represented by the formula RMgR′ wherein R represents a hydrocarbyl group selected from an alkyl group, cycloalkyl group, aryl group, arylalkyl group, alkenyl group, or cycloalkenyl group having from 1 to 16 carbon atoms, R′ represents a hydrocarbyl group selected from an alkyl group, cycloalkyl group, aryl group, arylalkyl group, alkenyl group, or cycloalkenyl group having from 1 to 16 carbon atoms and may be the same or different from R, or a halogen atom selected from chlorine, bromine, fluorine, or iodine, contacting the contact product therefrom with (c) carbon dioxide and contacting the contact product therefrom with (d) a titanium compound represented by the formula $TiX_p(OR^1)_{4-p}$ wherein $0 \leqq p \leqq 4$, X is a halogen and R^1 is an alkyl or aryl group having from 1 to 10 carbon atoms.

4,678,768

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Masahito Fujita; Makoto Miyazaki; Masami Kizaki; Yukio Nagashima, all of Saitama, and Yuichi Shimbori, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,618

Claims priority, application Japan, Jun. 21, 1984, 59-126378

The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—119 **25 Claims**

4. A catalyst component for polymerizing alpha-olefins obtained by contacting a product obtained by contacting (A) Mg(OR) (OR′), (B) a silicon compound having at least one silicon-hydrogen bond, (C) a divalent, trivalent, or tetravalent titanium compound selected from titanium halides and alkoxy titanium halides, and (E) an electron donor selected from a carboxylic acid, a carboxylic acid ester, a carboxylic acid anhydride and a carboxylic acid halide, with (D) one of (a) a hydrocarbon, (b) a halogenerated hydrocarbon, (c) a halide of a metal selected from the metals of Groups IIIa, IVa and Va of the Periodic Table, or mixtures thereof, wherein R and R′, which may be the same or different, are radicals selected from alkyl, alkenyl, cycloalkyl, aryl and aralkyl radicals.

8. The catalyst component of claim 4 wherein R and R′ are alkyl radicals having from one to eight carbon atoms, (B) the silicon compound is a hydrosilane represented by the formula $H_mR_n{}^1Si_X$, wherein R is a hydrocarbon group, R^2O—, R^3R^4N—, or R^5COO, X is a halogen atom, wherein the hydrocarbon groups represented by R^1, R^2, R^3, R^4 and R^5 and C_1 to C_{16} alkyl, alkenyl, cycloalkyl, aryl and aralkyl groups, m is an integer of 1 to 3, $0 \leqq r \leqq 4$, and $m+n+r=4$, (E) the electron donor is an alkyl ester of an aromatic carboxylic acid and (C) the titanium compound is $TiCl_4$.

4,678,769

APPARATUS FOR CATALYST PREPARATION BY REACTIVE SUBLIMATION

Bonnie J. King, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 762,646, Aug. 5, 1985, abandoned. This application Jun. 9, 1986, Ser. No. 873,842

Int. Cl.[4] B01J *27/06, 8/02*

U.S. Cl. 502—231 **4 Claims**

1. A process for preparing tantalum and/or niobium halide supported catalysts utilizing an apparatus which comprises:

(a) a sealed hollow first tube having a top and a bottom, said first tube having an inlet port at the top of said first tube and an outlet port at the bottom of said first tube,

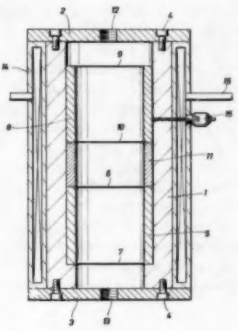
(b) a second tube having a top and a bottom, said second tube being fitted tightly inside said first tube and located at the bottom of said first tube, said second tube having a porous membrane at the top and bottom of said second tube whereby gas is permeable and catalyst pellets are not permeable through said porous membrane,

(c) a spacing means,

(d) a third tube having a top and a bottom, said third tube being fitted tightly inside said first tube and separated from said second tube by said spacing means, said third tube having a porous membrane at the top and bottom of said third tube whereby gas is permeable,

(e) a means for heating (b) and (d) to adjust the temperature of said second and third tubes,

which process comprises: placing a catalyst support selected



from the group consisting of silica, alumina and silica-alumina into said second tube, placing tantalum and/or niobium halide into said third tube, passing gas into said inlet port of said first tube and out at said outlet port of said first tube, subliming said tantalum and/or niobium halide by heating said third tube at a temperature ranging from about 140° C. to about 230° C. to form a tantalum and/or niobium halide vapor, and allowing said tantalum and/or niobium vapor to pass through said spacing means to allow expansion and dispersion of said tantalum and/or halide vapor into said second tube and contact with said catalyst support for a length of time sufficient to yield a tantalum and/or niobium halide supported catalyst.

4,678,770

THREE-WAY CATALYST FOR LEAN EXHAUST SYSTEMS

Chung-Zong Wan, Somerset; Joseph C. Dettling, Howell, and Kenneth I. Jagel, Stanton, all of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Continuation of Ser. No. 696,950, Jan. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 620,415, Jun. 14, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 842,746

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.[4] B01J *23/10, 23/42, 23/44, 23/46*

U.S. Cl. 502—304 **60 Claims**

1. An improved three-way catalyst, suitable for simultaneously oxidizing both gaseous hydrocarbons and carbon monoxide while reducing nitrogen oxides, said catalyst comprising a washcoat comprising rhodium dispersed on particles of gamma alumina, an amount of a rare earth oxide effective for enhancing oxidation of carbon monoxide and a second platinum group metal selected from the group consisting of platinum, palladium and mixtures thereof, the second platinum group metal being dispersed on particles selected from the group consisting of particles of rare earth oxide, particles of alumina, particles of gamma alumina stabilized with rare earth oxide and mixtures thereof; wherein the improvement comprises a substantial portion of the rhodium being dispersed on particles which are substantially rare earth oxide free, said

substantial portion of said rhodium being dispersed as crystallites having an initial particle size greater than about 2 nm.

4,678,771

ADSORPTION LAYER

Eberhard Beitinger, Stuttgart, and Eberhard Gläser, Aichwald, both of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart-Möhringen, Fed. Rep. of Germany

Filed Feb. 13, 1986, Ser. No. 829,524

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505076

Int. Cl.[4] B01J *20/20, 20/26*

U.S. Cl. 502—402 **16 Claims**

1. A combination of a plastic sealing membrane and an adsorption layer in which said adsorption layer reduces permeability and extends functional lifespan of a plastic sealing membrane if a medium to be retained contains organic hydrocarbons in a gaseous and/or liquid phase, such adsorption layer being installed for retaining predominantly liquid or gaseous organic hydrocarbons prior to such matter reaching the plastic sealing membrane which is a sealing sheet of synthetic material; said adsorption layer comprising:

a layer of activated carbon that is disposed, when viewed in the direction of flow of said matter that is to be retained, ahead of and upstream in relation to the direction of flow relative to said plastic sealing membrane.

4,678,772

COMPOSITIONS CONTAINING GLYCYRRHIZIN

Ruth Segal; Sara Pisanty, and Emma Azaz, all of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Continuation-in-part of Ser. No. 470,293, Feb. 28, 1983, abandoned. This application Sep. 25, 1984, Ser. No. 654,148

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—25 **2 Claims**

2. A method for the treatment of lesions caused by herpes simplex comprising topically administering to the affected areas in the oral cavity of a patient having lesions caused by herpes simplex about 0.2% by weight of idoxuridine in about 2.0% by weight of glycyrrhizin.

4,678,773

ANTITUMOR AGENT

Hiroko Usami; Akihiro Yamamoto, both of Tokyo; Yutaka Sugawara, Saitama; Shozo Kotani, Osaka, and Keijiro Kato, Okayama, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1984, Ser. No. 641,217

Claims priority, application Japan, Aug. 26, 1983, 58-155010; Aug. 26, 1983, 58-155011

Int. Cl.[4] A61K *31/70, 31/66, 31/045, 39/02*

U.S. Cl. 514—25 **11 Claims**

1. A method for inducing the production of TNF in a mammal comprising administering to the mammal a sufficient amount of lipoteichoic acid (LTA) to induce TNF in the mammal.

4,678,774

NOVEL SYNERGISTIC COMPOSITIONS

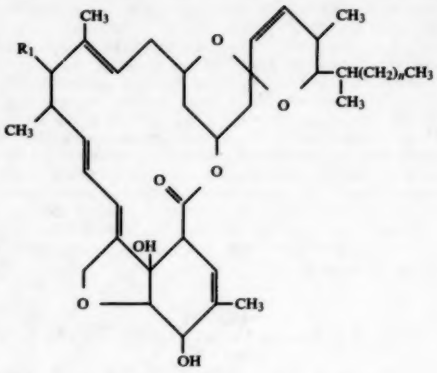
Irving Putter, Martinsville, N.J., and Daniel M. Stout, Kirkwood, Mo., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 6, 1985, Ser. No. 741,926

Int. Cl.[4] A01N *43/04, 25/00*

U.S. Cl. 514—30 **4 Claims**

1. An insecticidal synergistic composition consisting of an avermectin compound having the formula:



wherein

n is 0 or 1; and

R_1 is α-L-oleandrosyl-α-L-oleandrosyloxy;

absorbed onto highly dispersed, hydrophyllic amorphous silicon dioxide which has a surface area of from 35 to 400 m^2 per gram, an average particle size of from 7 to 40 nanometers and a standard uncompressed density of about 40 to 130 g/l and wherein the avermectin compound is present on the silicon dioxide at a ratio of from 10^{-3} to 10^2 μg of the avermectin per mg of the silicon dioxide.

4,678,775

METHOD OF CONTROLLING PESTS

James A. Nathanson, P.O. Box 719, 1 Grove St., Wellesley, Mass. 02181

Filed May 1, 1984, Ser. No. 605,847

Int. Cl.[4] A01N *43/04, 43/00, 43/84, 43/58*

U.S. Cl. 514—47 **21 Claims**

1. A method of controlling an invertebrate pest which comprises bringing into contact with said pest a pest-controlling amount of an agent selected from the group consisting of

(1) a non-formamidine-p-octopamine agonist having substantial activity toward an octopamine receptor present in said pest;

(2) a compound directly and substantially stimulating the enzyme, adenylate cyclase; and

(3) a cyclic adenosine monophosphate (cAMP) analogue.

4,678,776

PYRIDYL-THIONOPHOSPHORIC ACID ESTER USEFUL AS PESTICIDES

Fritz Maurer, Wuppertal; Bernard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

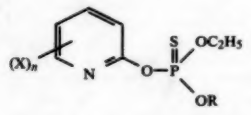
Filed Dec. 6, 1985, Ser. No. 806,159

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446104

Int. Cl.[4] A61K *31/44, 31/675;* **C07F** *9/06*

U.S. Cl. 514—89 **13 Claims**

1. A 2-pyridyl-thionophosphoric acid ester of the formula



in which

R is i-propyl or sec.-butyl,

X chlorine is and

n is 0,1, 2, 3 or 4.

11. An insecticidal, acaricidal or nematicidal composition comprising an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,678,777

PEST-COMBATING AGENTS CONTAINING PHOSPHORUS-HETEROCYCLIC COMPOUNDS

Bernd-Wieland Krüger; Hellmut Hoffmann, both of Wuppertal; Ernst Roos, Odenthal, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

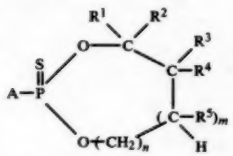
Filed Aug. 6, 1985, Ser. No. 762,979

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431256

Int. Cl.⁴ A01N *57/36*

U.S. Cl. 514—110 **10 Claims**

1. An arthropodicidal composition comprising an arthropodicidally effective amount of (A) an arthropodicidally active compound selected from the group consisting of arthropodicidally active carbamic acid esters, carboxylic acid esters, phosphoric acid esters and phosphonic acid esters and (B) a synergist compound of the formula



in which

A is C_1–C_4-alkyl or C_1–C_6-alkoxy,

R^1 is hydrogen, C_1–C_4-alkyl or halogen-substituted C_1–C_4-alkyl,

R^2, R^3, R^4 and R^5 each independently is hydrogen or C_1–C_4-alkyl, and

n and m each independently is 0 or 1 wherein the ratio of A to B is 1:5 to 5:1.

4,678,778

TRITHIOPHOSPHONATE INSECTICIDES

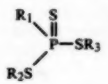
Alexandra B. Shortt, Houston, Tex., and William G. Haag, Pleasant Hill, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 704,814, Feb. 25, 1985, abandoned. This application Aug. 21, 1986, Ser. No. 898,544

Int. Cl.⁴ A01N *57/02*; **C07F** *9/40*

U.S. Cl. 514—141 **18 Claims**

1. A compound having the formula



in which R_1 is methyl or ethyl; R_2 is C_3–C_5 alkyl or monobromo-C_4-alkyl and R_3 is C_1–C_4 mono-bromoalkyl or 2,2,2-trifluoroethyl.

2. A method for controlling insects comprising applying to said insect or to a locus at which control is desired an insecticidally effective amount of a compound according to claim **1**.

4,678,779

WEIGHT CONTROL METHOD

Vera K. Meyers, University of Wisconsin-Parkside, Box No. 2000, Kenosha, Wis. 53141, and Ahmet Koman, Department of Pharmacology, Uppsala University Biomedicum Box 591, 751 24 Uppsala, Sweden

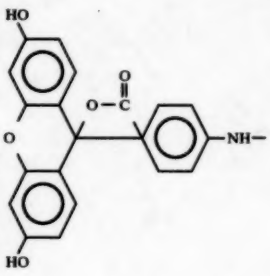
Filed Jan. 31, 1985, Ser. No. 697,212

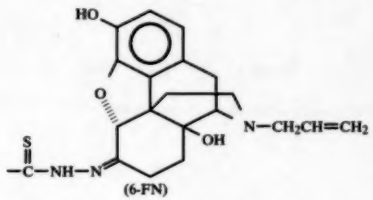
Int. Cl.⁴ A61K *31/58, 31/44*

U.S. Cl. 514—176 **6 Claims**

1. A method for controlling weight in a mammal comprising administering to said mammal a weight control agent for inhibiting weight gain, wherein said agent comprises a compound corresponding to he formula:

(Formula IX)





(6-FN)

4,678,780

ANTI-SPASMODIC AGENTS HAVING A RING IN THE MAIN CHAIN

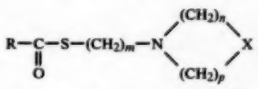
William M. Davis, Tucson, Ariz., assignor to United Pharmaceuticals, Inc., Tucson, Ariz.

Division of Ser. No. 703,264, Feb. 20, 1985. This application Oct. 27, 1986, Ser. No. 923,623

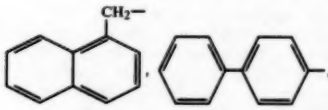
Int. Cl.⁴ A61K *31/55*

U.S. Cl. 514—183 **5 Claims**

1. A method of treating a patient suffering smooth muscle spasm comprising administering to the patient an effective anti-spasmodic amount of a compound having the formula:



wherein R is selected from the group consisting of:



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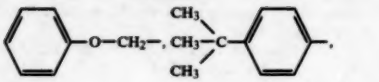
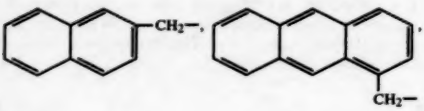
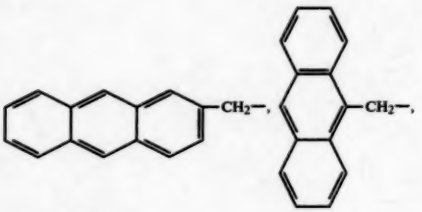
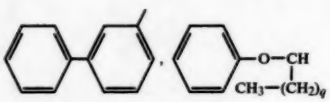
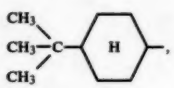


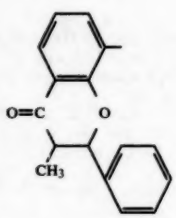


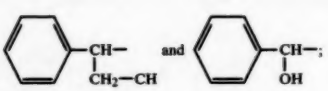




wherein q is an integer from 1 to 4,







the total number of carbon atoms in R is equal to or less than 20, and wherein

m is an integer from 1 to 4;

n is an integer from 1 to 4;

p is an integer from 1 to 4; and

X may be nonexistent such that an acyclic di(C_1–C_4)alkylamino group results or may be O, S, NH or CH_2 or a pharmaceutically acceptable salt thereof, but when X is nonexistent the terminal group in both the n-chain and the p-chain is a methyl group.

4,678,781

3-SUBSTITUTED-AMINOMETHYL CEPHALOSPORIN DERIVATIVES

Frederic Jung, le Moulin Cliguot, France, assignor to ICI Pharma, Enghien-les-Bains, France

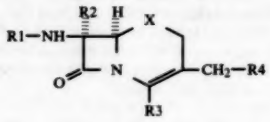
Filed Jun. 4, 1984, Ser. No. 616,891

Claims priority, application European Pat. Off., Jun. 3, 1983, 83401135.5

Int. Cl.[4] A61K *31/545;* **C07D** *501/18, 501/38*

U.S. Cl. 514—200 **11 Claims**

1. A cephalosporin compound of the formula I:

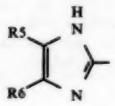


I

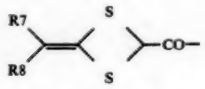
in which

X is sulphur or sulphinyl (R or S configuration);

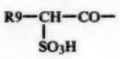
—R1 is of the formula II, III, IV, V, or VI:



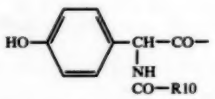
II



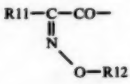
III



IV



V



VI

in which

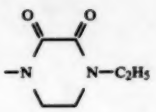
R5 and R6, are same or different, are hydrogen, halogen, cyano, hydroxy, carboxy, pyridyl, (1–6C)alkyl, (1–6C-)aminoalkyl, (1–6C)hydroxyalkyl, (2–6C)alkoxycarbonyl, (2–10C)alkylaminoalkyl, (3–15C)dialkylaminoalkyl, or phenyl optionally substituted by 1 or 2 radicals selected from halogen, nitro, amino, hydroxy, carboxy, cyano, (1–6C)alkyl or (2–6C)alkoxycarbonyl;

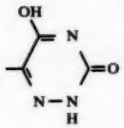
R7 is carboxy, (2–6C)alkoxycarbonyl, benzyloxycarbonyl, carbamoyl, (2–6C)alkylcarbamoyl, (3–8C)dialkylcarbamoyl carbazoyl, cyano or (2–6C)alkoxycarbonylamino;

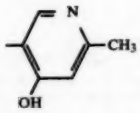
R8 is hydrogen, (1–4C)alkyl, (1–4C)alkoxy, (2–5C)alkanoyl, (1–4C)alkylthio, (1–4C)-alkylsulphinyl, (1–4C)alkylsulphonyl, phenyl, benzoyl, carboxy, (2–6C)alkoxycarbonyl, benzyloxycarbonyl, carbamoyl, carbazoyl, cyano, (2–5C-)alkenyl, sulphamoyl, (1–4C)hydroxyalkyl, (2–4C)carboxyalkyl, benzyl, hydroxyphenyl, {(1–4C)-alkoxy}phenyl, pyridyl or (methylthio)thiadiazolyl;

R9 is hydrogen, (1–6C)alkyl or phenyl;

R10 is of the formula VII, VIII or IX:


VII


VIII


IX

R11 is 2-aminothiazol-4-yl or 2-aminooxazol-4-yl each optionally substituted in the 5-position by fluorine, chlorine or bromine, or R11 is 5-aminoisothiazol-3-yl, 5-amino-1,2,4-thiadiazol-3-yl, 3-aminopyrazol-5-yl, 3-aminopyrazol-4-yl, 2-aminopyrimidin-5-yl, 2-aminopyrid-6-yl, 4-aminopyrimidin-2-yl, 2-amino-1,3,4-thiadiazol-5-yl or 5-amino-1-methyl-1,2,4-triazol-3-yl;

R12 is hydrogen, (1–6C)alkyl, (3–8C)cycloalkyl-(1–3C)alkyl(3–6C)cycloalkyl, (3–6C)cycloalkyl(1–3C)alkyl, (3–6C)alkenyl, (5–8C)cycloalkenyl, (3–6C)alkynyl, (2–5C)alkylcarbamoyl, phenylcarbamoyl, benzylcarbamoyl, triphenylmethyl, (1–3C)haloalkyl, (2–6C)hydroxyalkyl, (1–4C)alkoxy(2–4C)alkyl, (1–4C)alkylthio(2–4C)alkyl, (1–4C)alkanesulphinyl(1–4C)alkyl, (1–4C)alkanesulphonyl(1–4C)alkyl, (2–6C)aminoalkyl, (1–4C)alkylamino(2–6C)alkyl, (2–8C)dialkylamino(2–6C)alkyl, (1–5C)cyanoalkyl, (1–4C)azidoalkyl, (2–5C)ureidoalkyl, 3-amino-3-carboxypropyl, 2-(amidinothio)ethyl, 2-(N-aminoamidinothio)ethyl, tetrahydropyran-2-yl, thietan-3-yl or 2-oxotetrahydrofuran-3-yl, or

—R12 is of the formula $—(CH_2)_n—R13$ in which n is 1 to 4 and R13 is piperidino, pyrrolidino, morpholino, piperazino or N-methylpiperazino, each value of R13 being optionally substituted by (1–4C)alkyl, phenyl or benzyl, or

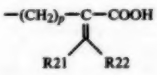
—R12 is of the formula $—(CH_2)_m—W—R14$ in which m is 0 to 3, W is sulphur or a direct bond, and R14 is phenyl or pyridinio(1–4C)alkylene or R14 is pyridyl, imidazolyl, 1,3,4-thiadiazolyl, tetrazolyl, 1-(1–4C)alkyltetrazolyl, thiazolyl, isothiazolyl or isoxazolyl in which the link with W is via a carbon or uncharged nitrogen, each value of R14 being optionally substituted, where possible, by one or two groups selected from (1–4C)alkyl, amino, hydroxy, carboxyl, carbamoyl, nitro, (2–5C)alkoxycarbonyl, cyano or sulpho, or

—R12 is of the formula $—(CH_2)_n—CO—R15$ in which n is 1 to 4 and R15 is (1–4C)alkyl, phenyl or benzyl, or

—R12 is of the formula —COR16 or $—(CH_2)_n—OCO—R16$ in which n is 1–4 and R16 is hydrogen, (1–4C)alkyl, (1–4C)haloalkyl, phenyl or benzyl, or

—R12 is of the formula $—G—CH_2—R17$ in which G is carbonyl or a direct bond and R17 is phthalimido, or

—R12 is of the formula X:


X

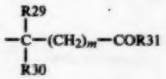
in which p is 1 or 2 and R21 and R22 are hydrogen or (1–4C)alkyl, or

—R12 is of the formula —P(O)R23R24 in which R23 is hydroxy, (1–4C)alkoxy, (2–8C)dialkylamino, phenoxy, phenylamino or one of the values given above for R13, and R24 is (1–4C)alkyl, (1–4C)alkoxy, (2–8C)dialkylamino, phenoxy, phenylamino, piperidino, pyrrolidino, morpholino, piperazino or N-methylpiperazino, or

—R12 is of the formula $—CH_2P(O)R25R26$ in which R25 and R26 are hydroxy or (1–4C)alkoxy, or

—R12 is of the formula —CH(SR27)COOR28 in which R27 is (1–4C)alkyl and R28 is hydrogen or (1–6C)alkyl, or

—R12 is of the formula XI:


XI

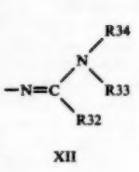
in which m is 0–3, R29 is hydrogen, (1–3C)alkyl or methylthio, R30 is hydrogen, (1–3C)alkyl, (3–7C)-cycloalkyl, cyano, carboxy, (2–5C)carboxyalkyl or methanesulphonylamino, or phenyl optionally substituted by amino or hydroxy, or R29 and R30 are joined to form, together with the carbon to which they are attached, a (3–7C)carbocyclic ring and R31 is hydroxy, amino, (1–4C)alkoxy, (1–4C)alkylamino, phenylamino or of the formula R13 given above or of the formula NHOR32 in which R32 is hydrogen, (1–4C)alkyl, phenyl or benzyl,

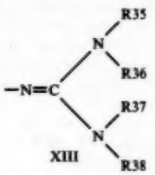
provided that when R12 contains phenyl, and unless otherwise stated, the phenyl is optionally substituted by 1 or 2 groups selected from halogen, hydroxy, amino, carboxy, nitro, carbamoyl, cyano, or aminomethyl;

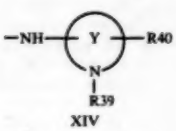
R2 is hydrogen or methoxy;

R3 is carboxy or a biodegradable ester thereof or where R4 carries a positive charge, a carboxylate anion;

—R4 is of the formula XII, XIII or XIV:


XII


XIII


XIV

or a tautomeric form thereof, in which the radical of the formula XIV may carry a positive charge, and in which

R32 is hydrogen, (1–6C)alkyl, phenyl, naphthyl or $—(CH_2)_q—COOR41$ in which q is 1 to 6 and R41 is hydrogen or (1–6C)alkyl;

R33 and R34 are selected from hydrogen, (1–6C)alkyl, hydroxy, cyano, phenyl, naphthyl, phenyl(1–6C)alkyl, heteroaryl or $—(CH_2)_q—COOR41$ in which q and R41 have the meanings given above, or

R33 and R34 are joined to form, together with the nitrogen to which they are attached, a pyrrolidine, piperidine, morpholine or hexahydroazepine ring, said ring being optionally fused to a benzene ring, or

R32 and R33 are joined by a carbon chain to form, together with the carbon and nitrogen to which they are attached. a 5- or 6-membered saturated ring to which may optionally be fused a benzene ring;

R35 and R37 are selected from hydrogen, (1–6C)alkyl, phenyl(1–6C)alkyl or $—(CH_2)_qCOOR41$ in which q is 1 to 6 and R41 is hydrogen or (1–6C)alkyl;

R36 and R38 are selected from hydrogen, (1-6C)alkyl, phenyl, naphthyl or phenyl(1-6C)-alkyl; or

R36 and R37 are joined as a carbon chain to form, together with the nitrogen-carbon-nitrogen chain to which they are attached, a saturated or partially unsaturated 5- or 6-membered ring to which may optionally be fused a benzene ring;

ring Y is pyridine, pyrimidine, oxazole, thiazole, isoxazole, isothiazole or imidazole to each of which is optionally fused, when possible, a benzene, cyclopentane or cyclohexane ring;

R39 is hydrogen, amino, (1-6C)alkyl, (3-6C)cycloalkyl, (3-6C)alkenyl, (2-8C)alkoxyalkyl, $-(CH_2)_q-COOR41$, $-(CH_2)_q-CONH_2$, $-(CH_2)_q-S(O)_s-R42$ or $-(CH_2)_q-NHCO-R42$ in which q is 1 to 6, R41 is hydrogen or (1-6C)alkyl, s is 0, 1 or 2 and R42 is (1-6C)alkyl or (1-6C)alkoxy, or

R39 is (3-8C)alkanoylmethyl, benzoylmethyl, hydroxy(1-6C)alkyl and amino(1-6C)alkyl, (1-4C)alkylamino(1-6C)alkyl, di(1-4C)alkylamino(1-6C)alkyl, (1-6C)alkoxy, (1-6C)alkylamino, phenyl(1-6C)alkyl, 4-nitrobenzyl, phenyl(1-6C)alkoxy, (1-4C)alkoxy(1-4C)alkyl, (1-4C)alkoxy(2-4C)alkoxy(1-4C)alkyl, or the formula $(CH_2)_n-N=CR43NR44R45$ or $(CH_2)_nC(NR43)NR44R45$ (or a tautomer thereof) in which n is 1 to 4 and R43, R44 and R45, same or different, are hydrogen or (1-4C)-alkyl;

R40 is hydrogen or one or two substituents selected from halogen, amino, nitro, (1-6C)alkyl, carboxy, (2-6C)alkoxycarbonyl, (1-6C)alkoxy, cyano, carbamoyl, (1-6C)haloalkyl, (1-6C)azidoalkyl, (1-6C)aminoalkyl, (2-4C)aminoalkylthio(1-4C)alkyl, (2-6C)alkanoylamino, (2-6C)alkanoylamino(1-4C)alkyl, (2-6C)alkanoyloxy(1-4C)alkyl, benzyl, benzyloxy or heteroarylthio;

wherein when R33, R34, R35, R36, R37, R38, R39 or R40 individually is or contains phenyl or naphthyl, the phenyl or naphthyl is optionally substituted by one or two radicals selected from halogen, nitro, cyano, carboxyl, hydroxy, carbamoyl, (1-6C)alkyl, (1-6C)alkoxy or (2-6C)alkoxycarbonyl, and wherein when R33 and R34 is heteroaryl, or R40 is heteroarylthio, the heteroaryl ring is a 5- or 6-membered ring containing 1, 2 or 3 heteroatoms selected from Oxygen, nitrogen or sulphur, provided that not more than one hetero atom shall be selected from the group consisting of oxygen and sulphur;

and, when the compound of the formula I does not carry a positive charge, the pharmaceutically-acceptable acid addition salts thereof, and where the compound of the formula I carries a carboxy, the pharmaceutically-accepted base-addition salts thereof.

4,678,782

3S-FORMAMIDO AZETIDINONE ANTIBACTERIAL AGENTS, THEIR PREPARATION AND USE

Roger J. Ponsford; Michael J. Pearson, both of Horsham, and Stephen C. Finch, Redhill, all of England, assignors to Beecham Group p.l.c., England

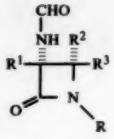
Division of Ser. No. 459,675, Jan. 20, 1983. This application Dec. 7, 1984, Ser. No. 679,574

Claims priority, application United Kingdom, Jan. 22, 1982, 8201752

Int. Cl.[4] C07D *205/08, 403/12;* **A61K** *31/395, 31/495*

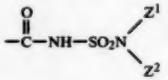
U.S. Cl. 514—210 **15 Claims**

1. A compound of the Formula (I):

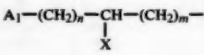


(I)

or a pharmaceutically acceptable salt thereof wherein R is:

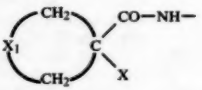


wherein Z^1 and Z^2 are the same or different and each is hydrogen, alkyl of 1 to 6 carbon atoms, aryl, amino or alkoxy of 1 to 6 carbon atoms; R^1 is amino, t-butylcarbonylamino, benzyloxycarbonylamino or benzylideneamino, or is selected from the sub-formulae (a)-(f):

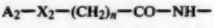


(a)

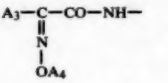
(b)



(c)

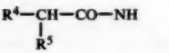


(d)



(e)

or

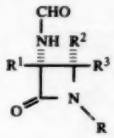


(f)

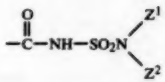
wherein n is zero, one or two, m is zero, one or two; A_1 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkenyl of 4 to 7 carbon atoms, cyclohexadienyl, phenyl, hydroxyphenyl, thienyl or pyridyl; X is a hydrogen, bromo, chloro, carboxy or a pharmaceutically acceptable ester thereof, sulpho, tetrazolyl, azido, hydroxy, acyloxy, amino, acylamino, heterocyclylamino, ureido, guanidino or acylureido group; A_2 is phenyl, 2,6-dimethoxy-phenyl, 2-alkoxy-1-naphthyl, 3-arylisoxazolyl, isothiazolyl or 3-aryl-5-methyl isoxazolyl; X_1 is CH_2OCH_2, CH_2SCH_2 or $(CH_2)_n$; X_2 is an oxygen or sulphur atom; A_3 is phenyl or aminothiazolyl; and A_4 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, arylaminocarbonyl, alkylaminocarbonyl of 1 to 6 carbon atoms, alkanoyl of 1 to 6 carbon atoms, alkoxycarbonyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, carboxyalkyl of 1 to 6 carbon atoms, alkylsulphonyl of 1 to 6 carbon atoms or di-alkylphosphatomethyl of 1 to 6 carbon atoms in each alkyl moiety; wherein heterocyclyl means a 5- or 6-membered heterocyclyl group containing one to three heteroatoms selected from sulphur, oxygen or nitrogen, said group being optionally substituted by one, two or three substituents selected from hydroxy, amino, halo and alkoxy of 1 to 6 carbon atoms; R^4 is a phenyl, thienyl or phenoxy group; R^5 is methyl; and R^2 and R^3 are independently selected from hydrogen or a hydrocarbon group of 1 to 18 carbon atoms.

9. A method of treating bacterial infections in humans and

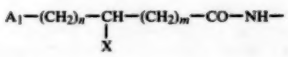
animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a compound of the Formula (I):


(I)

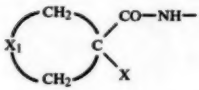
or a pharmaceutically acceptable salt thereof wherein R is:

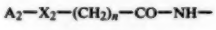


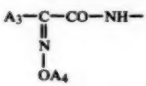
wherein Z^1 and Z^2 are the same or different and each is hydrogen, alkyl of 1 to 6 carbon atoms, aryl, amino or alkoxy of 1 to 6 carbon atoms; R^1 is amino, t-butylcarbonylamino, benzyloxycarbonylamino or benzylideneamino, or is selected from the sub-formulae (a)-(f):


(a)

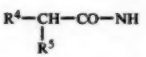
(b)


(c)


(d)


(e)

or


(f)

wherein n is zero, one or two, m is zero, one or two; A_1 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkenyl of 4 to 7 carbon atoms, cyclohexadienyl, phenyl, hydroxyphenyl, thienyl or pyridyl; X is a hydrogen, bromo, chloro, carboxy or a pharmaceutically acceptable ester thereof, sulpho, tetrazolyl, azido, hydroxy, acyloxy, amino, acylamino, heterocyclylamino, ureido, guanidino or acylureido group; A_2 is phenyl, 2,6-dimethoxy-phenyl, 2-alkoxy-1-naphthyl, 3-arylisoxazolyl, isothiazolyl or 3-aryl-5-methyl isoxazolyl; X_1 is CH_2OCH_2, CH_2SCH_2 or $(CH_2)_n$; X^2 is an oxygen or sulphur atom; A_3 is phenyl or aminothiazolyl; and A_4 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, arylaminocarbonyl, alkylaminocarbonyl of 1 to 6 carbon atoms, alkanoyl of 1 to 6 carbon atoms, alkoxycarbonyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, carboxyalkyl of 1 to 6 carbon atoms, alkylsulphonyl of 1 to 6 carbon atoms or di-alkylphosphatomethyl of 1 to 6 carbon atoms in each alkyl moiety; wherein heterocyclyl means a 5- or 6-membered heterocyclyl group containing one to three heteroatoms selected from sulphur, oxygen or nitrogen, said group being optionally substituted by one, two or three substituents selected from hydroxy, amino, halo an alkoxy of 1 to 6 carbon atoms; R^4 is a phenyl, thienyl or phenoxy group; R^5 is methyl; and R^2 and R^3 are independently selected from hydrogen or a hydrocarbon group of 1 to 18 carbon atoms, in combination with a pharmaceutically acceptable carrier.

4,678,783

SUBSTITUTED ISOQUINOLINESULFONYL COMPOUNDS

Hiroyoshi Hidaka, Tsu, and Takanori Sone, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

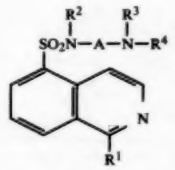
Filed Dec. 27, 1985, Ser. No. 813,973

Claims priority, application Japan, Dec. 27, 1984, 59-273908; Apr. 2, 1985, 60-68512

Int. Cl.[4] A61K *31/495, 31/47;* **C07D** *401/12, 217/22*

U.S. Cl. 514—218 **19 Claims**

19. A method of increasing the diameter of a human blood vessel which comprises intravenously or orally administering to human body an isoquinolinesulfonyl compound represented by the formula (I):


(I)

wherein R^1 represents a hydrogen atom, a chlorine atom or a hydroxyl group; and

when R^1 represents a hydrogen atom,

A represents an ethylene group unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms, a phenyl group or a benzyl group,

R^2 and R^3 are directly bonded with each other, thereby forming a trimethylene group unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms, a phenyl group or a benzyl group, and

R^4 represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; and

when R^1 represents a chlorine atom or a hydroxyl group,

A represents an alkylene group having 2 to 6 carbon atoms, said group being unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms,

R^2 and R^3 are not bonded with each other and each independently represent a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, or R^2 and R^3 are directly bonded with each other, thereby forming an ethylene group unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms or a trimethylene group unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms, and

R^4 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or an amidino group; or an acid salt thereof.

4,678,784

METHOD FOR THE TREATMENT OF LHRH DISEASES AND CONDITIONS

Chih Y. Ho, Lansdale, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 599,095, Apr. 11, 1984, Pat. No. 4,547,497, and a continuation-in-part of Ser. No. 721,723, Apr. 10, 1985, Pat. No. 4,587,244. This application Oct. 7, 1985, Ser. No. 784,963

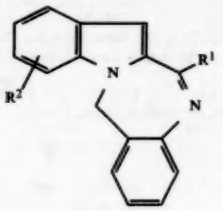
The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/55;* **C07D** *243/14*

U.S. Cl. 514—219 **5 Claims**

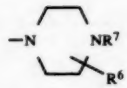
1. A method for antagonizing LHRH in a mammal which

comprises administering to a mammal in need thereof an effective amount of a pharmaceutical composition comprising a pharmaceutically acceptable diluent or carrier in association with a benzodiazepine of the following formula (I):



wherein

R^1 is an amine function of the formula



R^2 is hydrogen, alkoxy having 1–6 carbons, alkyl having 1–6 carbons, trifluoromethyl, halogen, nitro, hydroxy or dialkylamino having 2–10 carbons;

R^6 is hydrogen, alkyl having 1–8 carbons, carboxy, alkoxycarbonyl wherein the alkoxy group has 1–6 carbons or phenyl; and

R^7 is hydrogen, alkyl having 1–8 carbons, alkoxycarbonyl wherein the alkoxy group has 1–6 carbons or alkyl having 1–8 carbons substituted by hydroxy, halogen, alkoxy having 1–6 carbons, phenoxy or alkoxycarbonyl wherein the alkoxy group has 1–6 carbons;

and the pharmaceutically acceptable salts thereof.

4,678,785

THIADIAZINE COMPOUNDS

Hideki Ao; Minoru Obata, both of Oita, and Jun Inui, Saitama, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Oct. 29, 1985, Ser. No. 792,402

Claims priority, application Japan, Oct. 29, 1984, 59-227300

Int. Cl.[4] C07D *417/04*; A61K *31/54*

U.S. Cl. 514—222 **4 Claims**

1. 5-(3,4-dihydrocarbostyril-6-yl)-3,6-dihydro-1,3,4-thiadiazin-2-one.

3. A pharmaceutical composition comprising the compound of claim 1 in a therapeutically effective amount as a coronary vasodilator and a pharmaceutically acceptable carrier.

4,678,786

PHARMACEUTICAL COMPOSITIONS HAVING β-ADRENOCEPTOR ANTAGONIST ACTIVITY EMPLOYING PYRIDAZINONE DERIVATIVES

Anthony M. Roe, Hatfield; William J. Coates, Welwyn Garden City; Robert A. Slater, Letchworth; Stephen P. Breukelman, Bristol, and George D. Meakins, Oxford, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Continuation of Ser. No. 642,979, Aug. 21, 1984, abandoned. This application Aug. 13, 1986, Ser. No. 896,498

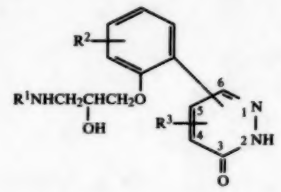
Claims priority, application United Kingdom, Sep. 2, 1983, 8323553

Int. Cl.[4] A61K *31/50*

U.S. Cl. 514—247 **11 Claims**

1. A pharmaceutical composition in dosage unit form having β-adrenoceptor antagonist activity comprising an effective amount to produce said activity of a compound of formula (I):

(I)



or a pharmaceutically acceptable salt thereof, wherein the substituted phenyl is attached at the 5-position of the 3[2H]-pyridazinone;

R^1 is isopropyl or tertiary-butyl;

R^2 is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy or amino; and

R^3 is hydrogen or methyl; and a pharmaceutically acceptable carrier.

4,678,787

4H-1-BENZOPYRAN-4-ONES AND THEIR SULFUR CONTAINING ANALOGS

Juan C. Jaen, Plymouth, and Lawrence D. Wise, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

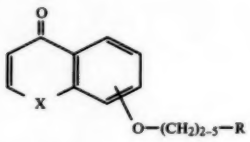
Continuation-in-part of Ser. No. 696,364, Jan. 30, 1985, abandoned. This application Nov. 22, 1985, Ser. No. 799,580

Int. Cl.[4] A61K *31/495*; C07D *405/14, 409/14*

U.S. Cl. 514—253 **23 Claims**

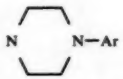
1. A compound having the formula

I



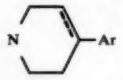
wherein X is oxygen or sulfur; and R is

A



or

B



wherein Ar is (a) phenyl, (b) phenyl substituted by lower alkyl, lower alkoxy, lower thioalkoxy, halogen, or trifluoromethyl, or (c) Het wherein Het is 2-, 3-, or 4-pyridinyl or 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen; 2-, 4-, or 5-pyrimidinyl or 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen; 2-pyrazinyl or 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen; 2- or 3-thienyl or 2- or 3-thienyl substituted by lower alkyl or halogen; 2- or 3-furanyl or 2- or 3-furanyl substituted by lower alkyl or halogen, or 2- or 5-thiazolyl or 2- or 5-thiazolyl substituted by lower alkyl or halogen; and ═══ is a single or double bond; and —$O(CH_2)_{2-5}$—R is at the 5, 6, 7, or 8 position

of the fused ring system; or pharmacologically acceptable acid addition salts thereof.

22. A method of treating psychosis in a subject suffering therefrom comprising administering to said subject an effective amount of a compound as claimed in claim 1 in unit dosage form.

4,678,788

N-SUBSTITUTED 2-CHLORO-7-FLUORO-10-PIPERAZINO-10,11-DIHYDRODIBENZO (B,F) THIEPINS AND ACID ADDITION SALTS THEREOF

Miroslav Protiva; Jiri Jilek; Irena Cervena; Antonin Diabac; Martin Valchar, and Josef Pomykacek, all of Prague, Czechoslovakia, assignors to Spofa, Spojene Podniky Pro Zdravotnickou Vyrobu, Prague, Czechoslovakia

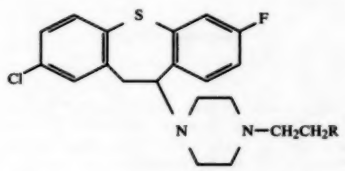
Filed Jan. 24, 1986, Ser. No. 821,992

Claims priority, application Czechoslovakia, Jan. 24, 1985, 516-85

Int. Cl.[4] A61K *31/495;* **C07D** *409/04*

U.S. Cl. 514—254 **6 Claims**

6. Composition useful for the treatment of schizophrenia in humans comprising an antidopaminergic and neuroleptic effective amount of an N-substituted 2-chloro-7-fluoro-10-piperazino-10,11-dihydrodibenzo(b,f)thiepin of the formula



in which R is selected from the group consisting of an aminocarbonyl, amino-oximinomethyl, 1,3-dioxolan-2-yl and 1,3-dioxan-2-yl group, and its addition salt with a pharmaceutically acceptable organic or inorganic acid, in a pharmaceutically acceptable carrier.

4,678,789

TRIAZOLE ANTIFUNGAL AGENTS

Kenneth Richardson, and Peter J. Whittle, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

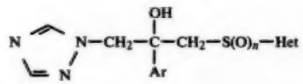
Filed Mar. 28, 1983, Ser. No. 479,525

Claims priority, application United Kingdom, Apr. 7, 1982, 82 10312

Int. Cl.[4] C07D *401/12, 403/12, 417/12;* **A61K** *31/41*

U.S. Cl. 514—262 **11 Claims**

1. A compound of the formula:



I

wherein

Ar is 2,4-dichlorophenyl;

n is 0, 1 or 2; and

Het is 2-imidazolyl, 2-thiazolyl, 3-(1,2,4-triazolyl), 5-tetrazolyl, 2-(1,3,4-thiadiazolyl), 2-, 3- or 4-pyridyl, 2- or 4-pyrimidinyl, quinolyl, benzothiazolyl or purinyl, each being optionally mono- or di-substituted by halo, CF_3, C_1–C_4 alkyl, amino, alkanoylamino or thio groups; and their pharmaceutically acceptable salts.

4,678,790

CERTAIN α-BENZYL-3-PYRIDYLMETHANOLS, N-OXIDES THEREOF AND THEIR FUNGICIDAL USE

Franz Dorn, Dielsdorf; Albert Pfiffner, Bülach, and Beat Zehnder, Kaiseraugst, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

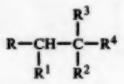
Filed Oct. 1, 1984, Ser. No. 655,812

Claims priority, application Switzerland, Oct. 7, 1983, 5458/83; Jul. 26, 1984, 3620/84

Int. Cl.[4] C07D *213/30;* **A01N** *43/40*

U.S. Cl. 514—277 **19 Claims**

1. A compound of the formula



wherein

R is mono-, di- or trisubstituted phenyl, the substituents being selected from the group consisting of halogen, C_{1-3}-alkyl, C_{1-3}-alkoxy and combinations thereof with the proviso that there are no more than two of the alkyl or alkoxy substituents on the trisubstituted phenyl;

R^1 is C_{1-6}-alkyl, C_{3-6}-alkenyl, C_{3-6}-alkynyl, phenylthio, C_{1-6}-alkylthio, C_{3-6}-alkenylthio, C_{3-6}-alkynylthio, C_{3-6}-alkynylthio monosubstituted with C_{1-4}-alkoxy, or a mono-, di- or trisubstituted phenylthio, the substituents being selected from the group consisting of halogen, C_{1-3}-alkyl, C_{1-3}-alkoxy, nitro and combinations thereof with the proviso that there is no more than one nitro substituent on the di- or trisubstituted phenylthio and that there are no more than two C_{1-3}-alkyl or C_{1-3}-alkoxy substituents on the trisubstituted phenylthio;

R_2 is hydroxy; R^3 is C_{2-6}-alkenyl, —C≡CR^5, phenyl-C_{1-3}-alkyl or mono-, di- or trisubstituted phenyl-C_{1-3}-alkyl, the substituents being selected from the group consisting of halogen, C_{1-3}-alkyl, C_{1-3}-alkoxy, nitro and combinations thereof with the proviso that there is no more than one nitro substituent on the di- or trisubstituted phenyl-C_{1-3}-alkyl and that there are no more than two C_{1-3}-alkyl or C_{1-3}-alkoxy substituents on the trisubstituted phenyl-C_{1-3}-alkyl;

R^4 is 3-pyridyl or 3-pyridyl 1-oxide; and

R^5 is hydrogen, phenyl, vinyl, bromine, iodine, C_{1-6}-alkoxy, C_{1-10}-alkyl, C_{1-10}-alkyl disubstituted with C_{1-3}-alkoxy, C_{1-10}-alkyl monosubstituted with C_{1-3}-alkoxy, chlorine or bromine, or mono-, di- or trisubstituted phenyl, the substituents being selected from the group consisting of halogen, C_{1-3}-alkyl, C_{1-3}-alkoxy and combinations thereof with the proviso that there are no more than two of the alkyl or alkoxy substituents on the trisubstituted phenyl; or an acid addition salt thereof.

10. A method for combatting plant fungi which comprises treating the locus to be protected with an effective amount of a compound in accordance with claim 1.

4,678,791

6-PHENYL-1,2-3,4,4A,5-6,10B-OCTAHYDROBENZ(-H)ISOQUINOLINES USEFUL FOR TREATING DEPRESSION

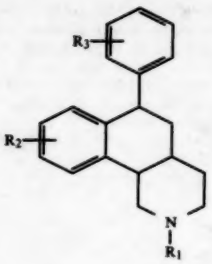
James J. Napier, Chili, and Ronald C. Griffith, Pittsford, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 7, 1985, Ser. No. 731,426

Int. Cl.[4] A61K *31/47;* **C07D** *221/10*

U.S. Cl. 514—290 **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, C_1–C_7 alkyl, or C_4–C_8 cycloalkylmethyl;

R_2 is hydrogen or a single or multiple substitution of hydroxyl, halogen, C_1–C_7 alkoxy, or C_1–C_7 alkyl; and

R_3 is hydrogen or a single or multiple substitution of hydroxyl, halogen, C_1–C_7 alkoxy, phenoxy, C_1–C_7 alkyl, or trifluoromethyl; all stereiosomeric forms and mixtures thereof, and pharmaceutically acceptable addition salts thereof.

7. The method of treating depression comprising the administration of an effective amount of a compound of claim 1 to a human in need of such treatment.

4,678,792

QUATERNARY 3,4-DIHYDRO-ISOQUINOLINIUM SALTS

Josef Nickl; Erich Muller; Benthold Narr; Helmut Ballhause, and Walter Haarmann, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

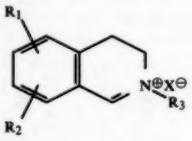
Filed Feb. 28, 1985, Ser. No. 706,579

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407955

Int. Cl.[4] A61K *31/47*

U.S. Cl. 514—307 **15 Claims**

1. A pharmaceutical composition containing an amount effective to prevent or treat a thromboembolic disease of a 3,4-dihydroisoquinolinium salt of formula I



(I)

wherein

R_1 and R_2 are each independently hydrogen, C_1–C_3 alkyl or C_1–C_3 alkoxy;

R_3 is a C_7–C_9 aralkyl, the phenyl nucleus of which can be mono-, di- or trisubstituted by halogen, C_1–C_3 alkyl or C_1–C_3 alkoxy; and

X represents the anion of a pharamaceutically acceptable inorganic or organic acid, together with one or more pharmaceutically acceptable carriers or diluents.

4,678,793

HETEROCYCLIC COMPOUNDS

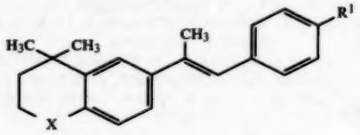
Michael Klaus, Weil am Rhein, Fed. Rep. of Germany, and Peter Loeliger, Muttenz, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 491,618, May 5, 1983. This application Apr. 1, 1985, Ser. No. 718,674

Int. Cl.[4] A61K *31/47*; C07D *215/14*

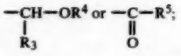
U.S. Cl. 514—311 **17 Claims**

1. A compound of the formula:



wherein X is

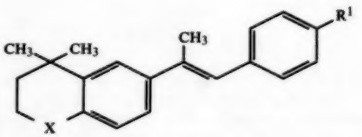
R^1 is methyl,



R^2 is hydrogen or lower alkyl; R^3 is hydrogen or methyl; R^4 is hydrogen, lower alkyl or alkanoyl; R^5 is hydrogen, lower alkyl, amino, lower alkylamino, di(lower alkyl)-amino or OR^6; and R^6 is hydrogen or lower alkyl;

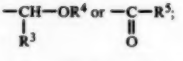
or pharmaceutically acceptable salts thereof.

6. A method for combatting acne or psoriasis comprising administering to a patient an effective amount of a compound of the formula



wherein X is

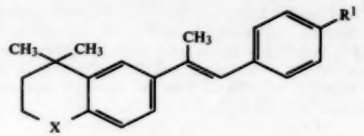
R^1 is methyl,



R^2 is hydrogen or lower alkyl; R^3 is hydrogen or methyl; R^4 is hydrogen, lower alkyl or alkanoyl; R^5 is hydrogen, lower alkyl, amino, lower alkylamino, di(lower-alkyl-)amino or OR^6; and R^6 is hydrogen or lower alkyl;

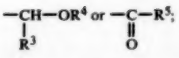
or pharmaceutically acceptable salts thereof.

11. A method for combatting neoplasms comprising administering to a patient in an effective amount of a compound of the formula:



wherein X is

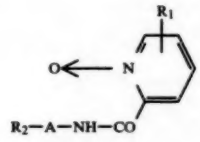
R^1 is methyl,



R^2 is hydrogen or lower alkyl; R^3 is hydrogen or methyl; R^4 is hydrogen, lower alkyl or lower alkanoyl; R^5 is hydrogen, lower alkyl, amino, alkylamino, di(lower-alkyl-)amino or OR^6; and R^6 is hydrogen or lower alkyl;
or pharmaceutically acceptable salts thereof.

4,678,794
N-PYRIDYL-SUBSTITUTED PYRIDINE-2-CARBOXAMIDE-1-OXIDES
Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England
Filed Nov. 5, 1985, Ser. No. 795,065
Claims priority, application United Kingdom, Nov. 6, 1984, 8428007
Int. Cl.[4] C07D *401/12;* A61K *31/44*
U.S. Cl. 514—332 **10 Claims**

1. A pharmaceutical composition useful as an anti-ulcer agent comprising an effective amount of a compound having the formula I

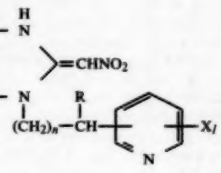


(I)

or a pharmaceutically acceptable acid addition salt thereof wherein R_1 is selected from hydrogen and lower alkyl, A is selected from a direct bond and lower alkylene and R_2 is selected from pyridinyl and pyridinyl monosubstituted by lower alkyl, in association or combination with a pharmaceutically acceptable carrier.

4,678,795
1-PYRIDYLMETHYL-2-NITROMETHYLENE-1,3-DIAZACYCLOALRANE INSECTICIDES
Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shinzo Kagabu, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan
Filed Apr. 8, 1985, Ser. No. 720,838
Claims priority, application Japan, Apr. 13, 1984, 59-72966; Jun. 29, 1984, 59-132943
Int. Cl.[4] C07D *401/02;* A61K *31/415*
U.S. Cl. 514—341 **9 Claims**

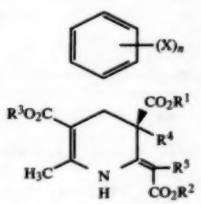
1. A nitromethylene derivative of the formula



in which
R is a hydrogen atom or a lower alkyl group,
X is a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkylthio group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, a lower alkenyl group, a lower alkynyl group, a phenyl, phenoxy, phenylthio, naphthyl, naphthoxy or naphthylthio group; a halogen substituted phenyl, phenoxy, phenylthio, naphthyl, naphthoxy or naphthylthio group; or a benzyl, phenethyl or naphthylmethyl group,
l is 1, 2, 3 or 4, and
n is 0, 1, 2 or 3,
or a salt thereof.

4,678,796
2-ALKYLIDENE DERIVATIVES OF 1,2,3,4-TETRAHYDROPYRIDINE-2,5-PYRIDINE CARBOXYLIC ACID DIALKYL ESTERS USEFUL FOR TREATMENT OF CARDIOVASCULAR DISORDERS
Michael D. Taylor, Ann Arbor, and Edward W. Badger, Dexter, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.
Continuation of Ser. No. 677,150, Nov. 30, 1984, abandoned. This application Sep. 3, 1986, Ser. No. 903,882
Int. Cl.[4] C07D *211/90, 401/12, 405/12;* A61K *31/455*
U.S. Cl. 514—356 **5 Claims**

1. A compound having the formula (I)



I

wherein R^1, R^2, and R^3 are independently alkyl of from one to six carbons, inclusive; R^4 and R^5 are hydrogen or alkyl of from one to six carbons, inclusive; n is an integer of one to five inclusive, X may be the same of different and is selected from one to three carbons, inclusive; NO_2, fluorine, chlorine, bromine, trifluoromethyl, methoxy, amino, and alkylamino of from one to six carbons, inclusive; or a pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition for the treatment of congestive heart failure, coronary heart disease, mycardial ischemia, angine, or hypertension comprising an effective amount for use to increase myocardial contractility, and as an antimycardial ischemic, antianginal, or antihypertensive, of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

4,678,797

BIOLOGICALLY ACTIVE AGENTS CONTAINING SUBSTITUTED ISOXAZOLIDINES

Axel Ingendoh, Velbert; Friedrich Berschauer, Wuppertal; Benedikt Becker, Mettmann; Wilhelm Stendel, Wuppertal; Bernhard Homeyer, Leverkusen; Martin Scheer; Anno de Jong, both of Wuppertal; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

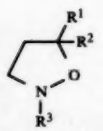
Filed May 10, 1985, Ser. No. 733,449

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418395

Int. Cl.[4] A61K *31/42*

U.S. Cl. 514—378 **8 Claims**

1. A method of combating insects, arachnids, nematodes or fungi which comprises applying to such insects, arachnids, nematodes or fungi or to a habitat thereof an insecticidally, arachnicidally, nematicidally or fungicidally effective amount of a substituted isoxazolidine of the formula



in which

R^1 represents C_{1-5}-alkyl, C_{3-6}-cycloalkyl, phenyl-C_{1-4}-alkyl, phenyl, naphthyl or pyridyl, which can be substituted by nitro, OH, CN, halogen, C_{1-4}-alkyl, C_{3-6}-cycloalkyl, C_{1-4}-alkoxy, C_{1-4}-alkylthio, C_{1-4}-halogenoalkyl, C_{1-4}-alkoxycarbonyl, carboxyl (COOH), amino, C_{1-4}-alkylamino, di-C_{1-4}-alkylamino, phenylamino, phenyl-C_{1-4}-alkylamino, aminocarbonyl-C_{1-4}-alkyl, (—$NHCOC_{1-4}$-alkyl), C_{1-4}-alkylsulphonylamino (—$NHSO_2C_{1-4}$-alkyl), C_{1-4}-halogenoalkoxy, C_{1-4}-halogenoalkylthio, C_{1-4}-alkylenedioxy, C_{1-4}-halogenoalkylenedioxy, phenyl, naphthyl, phenoxy or naphthoxy, or represents a radical of the formula —COR^4,

R^4 represents C_{1-4}-alkyl, phenyl, C_{1-4}-alkylthio, phenoxy, phenylthio, amino, C_{1-4}-alkylamino, di-C_{1-4}-alkylamino, phenylamino, naphthylamino, phenyl-C_{1-4}-alkylamino, diphenylamino, C_{3-6}-cycloalkylamino, morpholino or piperidino,

R^2 represents hydrogen or one of the radicals mentioned under R^1, and

R^3 represents C_{1-10}-alkyl, C_{3-6}-cycloalkyl, C_{2-4}-alkenyl, C_{2-6}-alkinyl, phenyl or naphthyl, or represents C_{1-6}-alkyl, which is substituted by halogen, OH, CN, amino, C_{1-4}-alkylamino, C_{1-4}-di-alkylamino, C_{1-4}-alkoxy, C_{3-6}-cycloalkyl, phenyl, naphthyl, phenoxy, phenylthio or C_{1-4}-alkylcarbonyloxy; or represents phenyl which is substituted by halogen, NO_2, CN, OH, amino, C_{1-4}-alkylamino, di-C_{1-4}-alkylamino, or (—$COOC_{1-4}$-alkyl), or represents phenoxy, naphthyloxy or biphenyloxy,

or an acid addition salt thereof.

4,678,798

N-(AZOLYLCARBAMYL)-HYDROXYLAMINES AND FUNGICIDES CONTAINING THESE COMPOUNDS

Costin Rentzea, Heidelberg; Hubert Sauter, Mannheim; Stefan Karbach, Ludwigshafen; Wolfgang Will, Mannheim; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

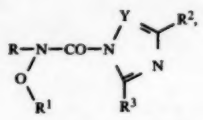
Filed Apr. 18, 1985, Ser. No. 724,761

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415138

Int. Cl.[4] C07D *249/08, 233/56;* A61K *31/41*

U.S. Cl. 514—383 **3 Claims**

1. An N-(azolylcarbamyl)-hydroxyamine of the formula



(I)

where R is a member selected from the group consisting of alkyl, alkenyl, alkoxyalkyl, cycloalkyl, alkyl substituted by cycloalkyl or cycloalkyl substituted by alkyl, each member consisting of not more than 12 carbon atoms, or phenyl, phenyl-C_1–C_4-alkyl, phenyl-C_2–C_3-alkenyl or phenoxy-C_1–C_6-alkyl, each of which is unsubstituted or substituted by halogen, cyano, nitro, trifluoromethyl, C_1–C_4-alkyl or C_1–C_4-alkoxy, R^1 is a member selected from the group consisting of alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, cycloalkyl or cycloalkylalkyl, each member consisting of not more than 12 carbon atoms, or benzyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, nitro or cyano, Y is CH or N, and R^2 and R^3 are identical or different and are each hydrogen or alkyl of 1 to 5 carbon atoms.

4,678,799

1,2(1,4)-DIMETHYL-4(2)-(2-HYDROXYETHYL)-5-NITROIMIDAZOLE ANTIPROTOZOAL AGENTS WITH REDUCED MUTAGENICITY

Gerald T. Miwa, Maplewood, and John S. Walsh, Avenel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 24, 1984, Ser. No. 685,944

Int. Cl.[4] A61K *31/415;* C07D *233/94*

U.S. Cl. 514—398 **5 Claims**

1. A compound selected from the group consisting of:
(A) 1,4-dimethyl-2-(2-hydroxyethyl)-5-nitroimidazole; and
(B) 1,2-dimethyl-4-(2-hydroxyethyl-5-nitroimidazole.

5. A method for the treatment of parasitic infections in animals which comprises administering to an animal with parasitic infections, an effective amount of a compound of claim 1.

4,678,800

GAMMA-R-GLUTAMOYL DERIVATIVES

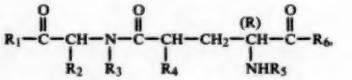
James L. Stanton, Ossining, and Gary M. Ksander, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 15, 1984, Ser. No. 621,302

Int. Cl.[4] C07D *209/12;* A61K *31/40*

U.S. Cl. 514—412 **11 Claims**

1. A compound of the formula



(I)

wherein R_1 represents hydroxy, C_1–C_4-alkoxy, di-C_1–C_4-alkylamino-C_2–C_4-alkoxy, pyrid-2-, -3-or -4-yl-methoxy, or amino; R_2 and R_3 together with the adjacent —CH— group

and the adjacent N-atom form a octahydroindolyl or a dihydroindolyl moiety; R_4 represents hydrogen; R_5 is carbamoyl, C_1–C_4-alkanoyl, nicotinoyl, isonicotinoyl, picolinoyl, C_1–C_4-alkoxycarbonyl, benzyloxycarbonyl, C_1–C_4-alkylsulfonyl benzenesulfonyl or p-toluenesulfonyl; and R_6 represents hydroxy, C_1–C_4-alkoxy, de-C_1–C_4-alkylamino-C_2–C_4-alkoxy, pyrid-2-, -3- or -4-ylmethoxy; or a pharmaceutically acceptable salt of a compound of the formula I that has a free carboxy group or a basic salt forming group.

2. A compound according to claim 1 wherein R_1 represents hydroxy, C_1–C_4-alkoxy, di-C_1–C_4-alkylamino-C_2–C_4alkoxy, pyrid-2-, -3- or -4-ylmethoxy, or amino; R_2 and R_3 together with the adjacent -CH- group an the adjacent N-atom form a octahydroindolyl or dihydroindolyl moiety; R_4 represents hydrogen, R_5 represents C_1–C_4-alkanoyl, nicotinoyl, isoicotinyl, picolinoyl, benzyloxycarbonyl, mesyl, benzenesulfonyl, or p-toluenesulfonyl; and R_6 represents hydroxy or C_1–C_4-alkoxy; or a pharmaceutically acceptable salt of a said compound of the formula I that haa a free carboyx group or has a basic salt forming group.

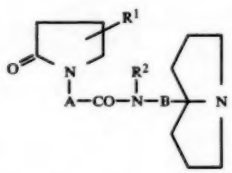
9. A method for the treatment of cardiovacular diseases responsive to angiotensin-converting enzyme inhibition in a mammal comprising administering to a mammal in need of said treatment an effective angiotensin-converting enzyme inhibiting amount of a compound of claim 2 or of a pharmaceutical composition comprising said compound together with one or more pharmaceutically acceptable carriers.

4,678,801
NOVEL 2-OXOPYRROLIDINE COMPOUNDS, SALTS THEREOF PROCESS FOR THE PREPARATION THEREOF AS WELL AS PHARMACEUTICAL AGENT COMPRISING THE COMPOUND

Masayasu Kurono, Mie; Motohide Hayashi, Kasugai; Tsunemasa Suzuki, Kumamoto; Kenji Miura, Kasugai; Yoshihiro Kumagai, Kasugai; Yukiharu Matsumoto, Kasugai; Seiji Miyano, Fukuoka, and Kunihiro Sumoto, Ohnojo, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

Filed Jul. 10, 1986, Ser. No. 884,125
Claims priority, application Japan, Jul. 23, 1985, 60-161213
Int. Cl.[4] A61K *31/40;* **C07D** *487/06*
U.S. Cl. 514—413 **14 Claims**

1. A 2-oxopyrrolidine compound represented by the formula

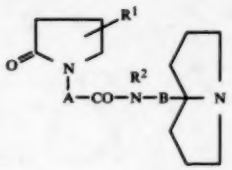


(I)

wherein R^1 and R^2 are independently hydrogen, straight-chain alkyl of 1–10 carbon atoms, branched-chain alkyl of 3–5 carbon atoms, or cycloalkyl of 3–6 carbon atoms, A is straight-chain alkylene of 1–3 carbon atoms; branched-chain alkylene of 2–10 carbon atoms, each of said alkylene being unsubstituted or substituted with a phenyl group, and B is straight-chain alkylene of 1–3 carbon atoms or branched-chain alkylene of 2–10 carbon atoms,

or a non-toxic acid-addition salt thereof.

8. An agent for preventing and curing a cerebral dysfunction, which comprises, as an effective component, a cerebral dysfunction preventing amount of at least one 2-oxopyrrolidine compound represented by the formula



wherein R^1 and R^2 are independently hydrogen, straight-chain alkyl of 1–10 carbon atoms, branched-chain alkyl of 3–5 carbon atoms, or cycloalkyl of 3–6 carbon atoms, A is straight-chain alkylene of 1–3 carbon atoms; branched-chain alkylene of 2–10 carbon atoms, each of said alkylene being unsubstituted or substituted with a phenyl group, and B is straight-chain alkylene of 1–3 carbon atoms or branched-chain alkylene of 2–10 carbon atoms,

or a pharmaceutically acceptable non-toxic acid-addition salt thereof

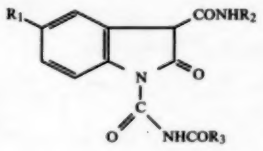
and a pharmaceutically acceptable diluent.

4,678,802
1-ACYLCARBAMOYLOXINDOLE-3-CARBOXAMIDES AS ANTIINFLAMMATORY AGENTS

Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 753,200, Jul. 9, 1985. This application Jan. 31, 1986, Ser. No. 825,017
Int. Cl.[4] C07D *209/12;* **A61K** *31/40*
U.S. Cl. 514—418 **8 Claims**

1. A compound of the formula



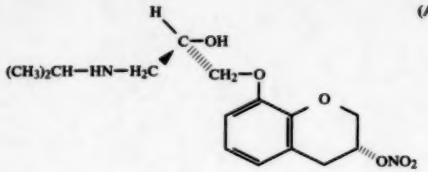
and a pharmaceutically acceptable base salt thereof, wherein R_1 is selected from the group consisting of hydrogen, acetyl, methyl, fluoro, chloro, bromo and methoxy; R_2 is selected from the group consisting of phenyl and mono- and disubstituted phenyl wherein said substituents are selected from the group consisting of chloro and fluoro; and R_3 is selected from the group consisting of alkyl having one to four carbon atoms and phenyl.

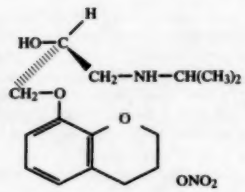
4,678,803
OPTICAL ISOMERS, PROCESSES FOR PRODUCTION THEREOF AND PHARMACEUTICAL COMPOSITION THEREOF

Masami Shiratsuchi, Musashimurayama; Kiyoshi Kawamura, Tokorozawa; Toshihiro Akashi; Hiroshi Ishihama, both of Higashimurayama, and Yasumi Uchida, Ichikawa, all of Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

Filed Mar. 27, 1985, Ser. No. 716,462
Claims priority, application Japan, Mar. 31, 1984, 59-62177
Int. Cl.[4] A61K *31/35;* **C07D** *311/64*
U.S. Cl. 514—456 **3 Claims**

1. An optical isomer selected from the group consisting of (2'R),(3R)-3,4-dihydro-8-(2'-hydroxy-3'-isopropylamino)-propoxy-3-nitroxy-2H-1-benzopyran represented by the following formula (A-2), (2'S),(3R)-3,4-dihydro-8-(2'-hydroxy-3'-isopropylamino)propoxy-3-nitroxy-2H-1-benzopyran represented by the following formula (B-2)

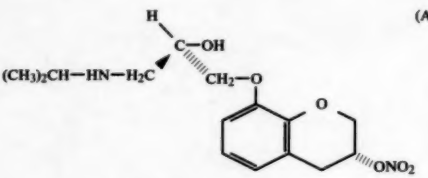


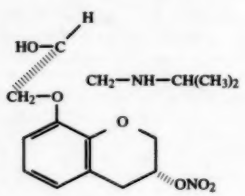


and pharmaceutically acceptable acid addition salts of these isomers.

2. A pharmaceutical composition comprising

(1) an amount, effective for the treatment of cardiovascular disseases, of an optical isomer selected from the group consisting of (2'R),(3R)-3,4-dihydro-8-(2'-hydroxy-3'-isopropylamino)propoxy-3-nitroxy-2H-1-benzopyran represented by the following formula (A-2), (2'S),(3R)-3,4-dihydro-8-(2'-hydroxy-3'-isopropylamino)-propoxy-3-nitroxy-2H-1-benzopyran represented by the following formula (B-2)





or a pharmaceutically acceptable acid addition salt of said isomer, and

(2) a pharmaceutically acceptable diluent or carrier.

4,678,804

FUNGICIDAL BENZYLTHIOSTANNANES

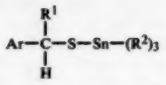
William F. King, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 2, 1985, Ser. No. 783,300

Int. Cl.[4] C07F 7/22; A01N 55/04; A61K 31/32

U.S. Cl. 514—493 **17 Claims**

1. compound of the formula:



wherein Ar is monohalophenyl, dihalophenyl, tolyl or dimethylphenyl; R^1 is hydrogen or lower alkyl of 1 to 3 carbon atoms; R^2 is lower alkyl of 1 to 6 carbon atoms, lower cycloalkyl of 3 to 8 carbon atoms, aralkyl of 7 to 11 carbon atoms or aryl of 6 to 10 carbon atoms.

12. A fungicidal composition which comprises an inert carrier and a fungicidally effective amount of a compound of claim 1.

4,678,805

NOVEL 8-(LOWER ALKYL)BICYCLO[4.2.0]OCTANE DERIVATIVES WITH VALUABLE THERAPEUTIC PROPERTIES

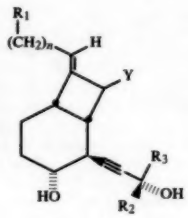
Arthur F. Kluge, Los Altos, and Helen Y. Wu, San Jose, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

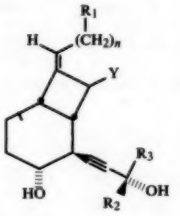
Continuation-in-part of Ser. No. 716,872, Mar. 27, 1985, Pat. No. 4,608,388. This application Jul. 28, 1986, Ser. No. 891,509

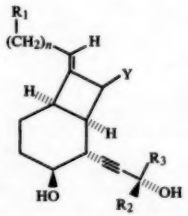
Int. Cl.[4] C07C 69/74

U.S. Cl. 514—510 **27 Claims**

1. A compound of formula (1), (2) or (3)







wherein:

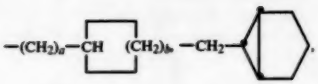
Y is exo-(lower alkyl) or endo-(lower alkyl);

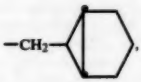
n is 2 or 3;

R_1 is CH_2OH, CHO, CO_2R or CO_2H;

R_2 is hydrogen or methyl; and

R_3 is linear or branched alkyl having 5–10 carbon atoms,





or —$(CH_2)_m$-phenyl optionally substituted with lower alkyl, lower alkoxy, trifluoromethyl, or halogen.

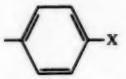
in which

a is 0, 1 or 2;

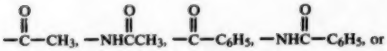
b is 3–7;

m is 1 or 2; and

R is



wherein X is



in which each R_4 is independently hydrogen or lower alkyl having 1–6 carbon atoms,

and the pharmaceutically acceptable, non-toxic salts and esters thereof.

4,678,806

PRODRUGS OF ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

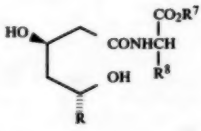
John J. Baldwin, Gwynedd Valley; Wasyl Halczenko, Hatfield; George Hartman, and Steven M. Pitzenberger, both of Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 2, 1986, Ser. No. 902,895

Int. Cl.[4] **A61K** *31/235;* **C07C** *101/72*

U.S. Cl. 514—539 **21 Claims**

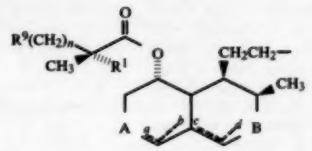
1. A compound represented by the general structural formula (I):



(I)

wherein R is selected from a group consisting of:

(a)

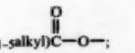


wherein

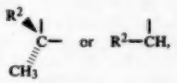
n is 1 to 6;

R^1 is hydrogen or methyl;

R^9 is hydrogen, hydroxy or



A is

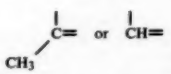


in which R^2 is hydrogen or hydroxyl;

B is

in which R^3 is hydrogen or hydroxyl;

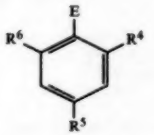
a, b, c and d represent single bonds, one of a, b, c and d represent a double bond or both a and c or both b and d represent double bonds, provided that when a is a double bond, A is



and when d is a double bond, B is

or

(b)



wherein:

E is —CH_2—, —CH_2CH_2— or —CH=CH—;

R^4 and R^5 are independently C_{1-3}alkyl, fluoro, bromo or chloro; and

R^6 is phenyl, benzyloxy, substituted phenyl or substituted benzyloxy in which the phenyl group in each case is substituted with one or more substituents selected from C_{1-3}alkyl, hydroxy-C_{1-3}alkyl fluoro, bromo or chloro;

R^7 is hydrogen or C_{1-8}alkyl; and

R^8 is C_{1-8}alkyl, hydroxy-C_{1-8}alkyl, phenyl-C_{1-8}alkyl, hydroxyphenyl-C_{1-8}alkyl amido-C_{1-8}alkyl, C_{1-8}alkoxy carbonyl-C_{1-8}alkyl, imidazol-4-yl-C_{1-8}alkyl, C_{1-8}alkylthio-C_{1-8}alkyl, 2-((C_{1-8}alkoxycarbonyl)pyrrolidin-4-yl)-C_{1-8}alkyl or indol-3-yl-C_{1-8}alkyl;

the amido ester moiety of which is in the L-configuration of a pharmaceutically acceptable salt of the compound of the formula (I) wherein R^7 is hydrogen.

18. A hypocholesterolemic, hypolipidemic pharmaceutical composition comprising a nontoxic therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

20. A method of inhibiting cholesterol biosynthesis comprising the administration to a subject in need of such treatment a nontoxic therapeutically effective amount of a compound of claim 1.

4,678,807

METHOD FOR DIRECTED VISCERAL METABOLISM OF MEDIUM CHAIN TRIGLYCERIDES

Richard Cotter, Libertyville; Robert C. Johnson, Westchester; W. Bruce Rowe, Chicago, and Susan K. Young, North Chicago, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 1, 1984, Ser. No. 584,974

Int. Cl.[4] A61K *31/23*

U.S. Cl. 514—552 **14 Claims**

1. A method of providing caloric nutrition to a dysfunctional visceral organ comprising parenterally administering to a patient with a dysfunctional visceral organ an effective amount of a lipic emulsion containing about from 10% to 50% by weight of LCT and the remaining lipid being MCT to thereby shift the supply of MCT energy substrates to the visceral organs and limit the availibility of MCT to the peripheral organs.

4,678,808

RAPID ACTING INTRAVENOUS EMULSIONS OF OMEGA-3 FATTY ACID ESTERS

Michael V. Ward, McHenry, and Richard Cotter, Libertyville, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 15, 1985, Ser. No. 787,741

Int. Cl.[4] A61K *31/20, 31/685*

U.S. Cl. 514—560 **17 Claims**

1. A lipid emulsion for parenteral use comprising an emulsifier, water and a marine oil comprising at least one omega 3 fatty acid ester wherein the concentration of free fatty acid in the emulsion is below about 5 meq/l and wherein the concentration of marine oil is between about 5% to about 50%.

4,678,809

INJECTABLE FOMULATIONS OF DISULFIRAM FOR THE TREATMENT OF ALCOHOLISM

Michael Phillips, 1740 Hinman Ave., Apt. 3B, Evanston, Ill. 60201

Filed Feb. 1, 1985, Ser. No. 697,103

Int. Cl.[4] A61K *31/16, 9/22, 9/30, 9/32*

U.S. Cl. 514—599 **2 Claims**

1. A process for preparing an injectable composition containing disulfiram as the active ingredient, which comprises; sterilizing the disulfiram with gamma irradiation, and then suspending the sterile disulfiram in sterile normal saline to form a slurry.

4,678,810

MEDICAL USES OF HALOGENOBENZOHENONE-OXIME DERIVATIVES

Bernard Danrée, Poissy, France, assignor to Institut de Recherches Chimiques et Biologiques of Appliques (I.R.C.E.B.A.), Paris, France

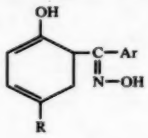
Continuation-in-part of Ser. No. 662,285, filed as PCT FR84/00018 on Jan. 27, 1984, published as WO84/02844 on Aug. 2, 1984, abandoned. This application Feb. 26, 1986, Ser. No. 833,015

Claims priority, application PCT Int'l Appl., Jan. 27, 1984, PCT/FR84/00018; France, Jan. 28, 1983, 83 01365

Int. Cl.[4] A61K *31/15*

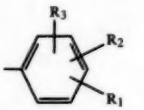
U.S. Cl. 514—640 **3 Claims**

1. A method of treating infectious disease caused by Gram+ bacteria and Neisseria Gram− bacteria comprising administering to a patient in need of such a treatment a pharmaceutically effective amount of a compound of the formula.



(I)

wherein R is a C_3–C_8 alkyl group with a branched hydrocarbon chain and Ar represents a halogenophenyl group of the formula



(II)

wherein R_1 is F, Cl or Br, and R_2 and R_3, which may be identical or different, represent each H, F, Cl or Br.

4,678,811

SUBSTITUTED BENZYLETHERS, PESTICIDES CONTAINING THESE COMPOUNDS AND METHOD FOR THEIR PREPARATION

Helga Franke; Heinrich Franke; Hans-Rudolf Krüger, and Hartmut Joppien, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

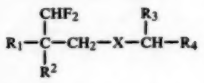
Filed Oct. 17, 1985, Ser. No. 788,285

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3438483

Int. Cl.[4] A01N *31/14;* **C07C** *43/225, 43/115*

U.S. Cl. 514—721 **46 Claims**

1. A compound of the formula



wherein

R_1 is aryl or aryl substituted by C_{1-4}-alkyl, halo-C_{1-4}-alkyl, phenyl-C_{1-4}-alkyl, C_{2-4}-alkenyl, halo-C_{2-4}-alkenyl, phenyl-C_{2-4}-alkenyl, C_{2-4}-alkynyl, halo-C_{2-4}-alkynyl, phenyl-C_{2-4}-alkynyl, C_{1-4}-alkoxy, halo-C_{1-4}-alkoxy, phenyl-C_{1-4}-alkoxy, C_{2-4}-alkenyloxy, halo-C_{2-4}-alkenyloxy, phenyl-C_{2-4}-alkenyloxy, C_{2-4}-alkynyloxy, halo-C_{2-4}-alkynyloxy, phenyl-C_{2-4}-alkynyloxy, halo, nitro, aryloxy, haloaryloxy, C_{1-4}-alkyl-aryloxy, or nitroaryloxy,

R_2 is hydrogen or C_{1-4} alkyl,

R_3 is hydrogen, or ethynyl,

R_4 is phenyl or or phenyl substituted by one or more of

C_{1-6}-alkyl, halo-C_{1-6}-alkyl, phenyl-C_{1-6}-alkyl, C_{1-6}-alkyl interrupted by an O-, atom, C_{2-4}-alkenyl, halo-C_{2-4}-alkenyl, phenyl-C_{2-4}-alkenyl, C_{1-4}-alkoxy, halo-C_{1-4}-alkoxy, phenyl-C_{1-4}-alkoxy, C_{2-4}-alkenyloxy, halo-C_{2-4}-alkenyloxy, phenyl-C_{2-4}-alkenyloxy, C_{2-4}-alkynyloxy, halo-C_{2-4}-alkynyloxy, phenyl-C_{2-4}-alkynyloxy, aryloxy, haloaryloxy, C_{1-4}-alkylaryloxy, aryl, haloaryl, C_{1-4}-alkylaryl or halo and

X is oxygen, and R_1-aryl is phenyl, 1-naphthyl or 2-naphthyl, and R_4-aryl is phenyl.

4,678,812

TREHALOSE AS STABILIZER AND TABLETING EXCIPIENT

Ernest Bollin, Jr., Bear, and Mark G. Fletcher, New Castle, both of Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed May 30, 1986, Ser. No. 868,668
Int. Cl.[4] A61K *45/08*
U.S. Cl. 514—777 **1 Claim**

1. In the method of tableting powders for diagnostic applications, wherein the powders are the product of an S-1 spray freezing process for obtaining frozen diagnostic droplets by spraying an aqueous solution of ingredients useful in diagnostic applications onto the surface of a moving bath of boiling perfluorocarbon liquid, followed by lypohilization of the droplets to dried powders suitable for tabletting, the improvement comprising tabletting the dried powders with the use of trehalose as tabletting excipient and stabilizer.

4,678,813

HYDROPHILIZED POROUS POLYOLEFIN MEMBRANE AND PRODUCTION PROCESS THEREOF

Hajime Itoh, Hiroshima, and Kazutami Mitani, Ohtake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 928,163
Claims priority, application Japan, Nov. 11, 1985, 60-252203; Nov. 12, 1985, 60-253561
Int. Cl.[4] C08J *9/26*
U.S. Cl. 521—61 **5 Claims**

1. A process for the production of a hydrophilized porous polyolefin membrane, which comprises the steps of holding a monomer which has an HLB value of 2–20 and contains at least one unsaturated polymerizable bond and a polymerization catalyst on at least a part of the pore walls of a starting porous polyolefin membrane and heating them to polymerize the monomer.

4,678,814

POLYACROLEIN MICROSPHERES

Alan Rembaum, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 520,313, Aug. 4, 1983, Pat. No. 4,622,362, Division of Ser. No. 248,899, Mar. 30, 1981, Pat. No. 4,413,070. This application Jul. 1, 1985, Ser. No. 750,028
Int. Cl.[4] C08F *2/54, 16/34*
U.S. Cl. 522—175 **21 Claims**

1. A method of preparing small polymeric microspheres comprising the steps of:

forming a solution of less than 5% by weight of a monomer mixture containing at least 10% by weight of an unsaturated aldehyde selected from the group consisting of acrolein and C_1 to C_8 aryl, alkyl and cycloalkyl derivatives thereof and at least 20% by weight of at least one addition copolymerizable monomer having a hydrophilic substituent selected from hydroxyl amino or carboxyl and 0.1 to 20% of a polyunsaturated crosslinking agent;

irradiating the solution with radiation capable of initiating polymerization; and

recovering said microspheres.

4,678,815

AQUEOUS SILICONE EMULSIONS AS BLADDER LUBRICANTS

Michael J. Hoffman, Clinton, Mich., assignor to Stauffer-Wacker Silicones Corporation, Adrian, Mich.

Filed Jun. 27, 1985, Ser. No. 749,256
Int. Cl.[4] C08K *5/10*; C08L *83/06*
U.S. Cl. 523—122 **9 Claims**

1. An aqueous organopolysiloxane emulsion comprising (1) from 20 to 70 percent by weight based on the weight of the organopolysiloxane emulsion of a hydroxyl-terminated organopolysiloxane gum having a plasticity value of from 50 to 100; (2) from 0.5 to 25 percent by weight based on the weight of the organopolysiloxane emulsion of an organohydrogenpolysiloxane fluid having a viscosity of from 10 to 100 mPa.s at 25° C. and an average of at least 3 Si-bonded hydrogen atoms per molecule; (3) from 0.05 to 5 percent by weight of a lubricant having a melting point of from 25° to 80° C., based on the weight of the organopolysiloxane emulsion; (4) from 2 to 12 percent by weight based on the weight of the organopolysiloxane emulsion of a thickening agent; (5) from 4 to 10 percent by weight based on the weight of the organopolysiloxane emulsion of a surfactant; and (6) from 15 to 60 percent based on the weight of the organopolysiloxane emulsion of water.

2. The organopolysiloxane emulsion of claim 1, wherein the organopolysiloxane emulsion contains from 0.05 to 0.3 percent by weight of a bactericide based on the weight of the organopolysiloxane emulsion.

7. The organopolysiloxane emulsion of claim 1, wherein the lubricant is lanolin.

4,678,816

MOULD MATERIAL BINDING AGENT SYSTEM WHICH COLD-HARDENS WITH FORMATION OF POLYURETHANE

Marek Torbus, Düsseldorf, Fed. Rep. of Germany, assignor to Hüttenes-Albertus Chemische Werke GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1985, Ser. No. 808,456
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445687
The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.
Int. Cl.[4] C08L *75/00*
U.S. Cl. 523—142 **3 Claims**

1. A mould material binding agent composition for the manufacture of foundry mould parts comprising a solution of a phenol-containing polyol having at least two OH-groups in the molecule and a polyisocyanate component having at least two NCO-groups in the molecule, said polyol and polyisocyanate component reacting with each other to form a cold-hardening binding agent, the polyisocyanate component containing a member of the group consisting of substituted and unsubstituted diphenyl-4, 4'-diisocyanates together with an addition of a member of the group consisting of acid chlorides and chlorosilanes and mixtures thereof, said polyisocyanate component also containing more than 10% by weight of a member of the group consisting of substituted and unsubstituted diphenyl-2, 4'-diisocyanates and mixtures thereof, the percentage relating to the total quantity of polyisocyanate component.

4,678,817
NOVEL DESENSITIZED KETONE PEROXIDE COMPOSITIONS AND THEIR USE IN THE MANUFACTURE OF FOUNDRY CORES OR MOULDS

John Meijer, Deventer, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Filed Jul. 9, 1986, Ser. No. 883,705
Claims priority, application Netherlands, Jul. 16, 1985, 8502042
Int. Cl.[4] B22C 11/22; C01B 15/00
U.S. Cl. 523—144 5 Claims

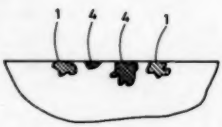
1. A desensitized ketone peroxide composition which contains as desensitizing agent a monocarboxylic acid diester of an alkane diol, characterized in that the diester consists of 2,2,4-trimethyl-1,3-pentanediol diisobutyrate.

4. A process for the manufacture of a foundry core or mould, in which process a composition comprising a granular filler, a synthetic resin which is curable under the influence of an acid and a desensitized ketone peroxide composition is formed into the desired foundry core or mould and treated with sulphur dioxide, characterized in that the ketone peroxide composition contains 2,2,4-trimethyl-1,3-pentanediol diisobutyrate as desensitizing agent.

4,678,818
FRICTION MATERIAL AND METHOD OF MAKING SUCH MATERIAL

Mitsuhiko Nakagawa, and Fumiaki Nitto, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 19, 1985, Ser. No. 799,404
Claims priority, application Japan, Dec. 13, 1984, 59-263641
Int. Cl.[4] C29C 29/00, 29/12; C10M 125/02, 125/04
U.S. Cl. 523—157 2 Claims



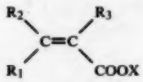
1. A friction material, comprising in percent by volume 10 to 35% of a matrix forming binder material, a separate combination of graphite and 0.5 to 15% of a metal or metal alloy softer than steel, said combination being prepared prior to any embedding in said matrix forming binder material, by separately mixing a graphite powder with said metal or metal alloy softer than steel to form an intermediate product, solidifying and then crushing said intermediate product to form said combination which is then embedded in said matrix material, and 5 to 35% of a friction causing component selected from the group consisting of steel fibers, steel powder, asbestos fibers, glass fibers, rock wool, glass wool, carbon fibers, acrylic fibers, and aramid fibers also embedded in said matrix forming binder material, the remainder being said graphite and a filler.

4,678,819
COMPOSITIONS FOR ARTIFICIAL MARBLES AND PROCESS FOR PRODUCING ARTIFICIAL MARBLES THEREFROM

Isao Sasaki, Hiroshima, and Nobuhiro Mukai, Ohtake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

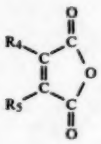
Filed Aug. 20, 1985, Ser. No. 767,433
Claims priority, application Japan, Aug. 30, 1984, 59-181389; Aug. 31, 1984, 59-182968
Int. Cl.[4] C08K 7/14, 3/00, 9/04, 9/00
U.S. Cl. 523—171 19 Claims

1. A composition for artificial marble which comprises a polymer composition, in which an inorganic substance and an organic polymer are firmly bound in one body, and a vinyl compound comprising methyl methacrylate, said polymer composition being obtained by heterogeneously polymerizing methyl methacrylate or a mixture of methyl methacrylate and other vinyl monomer susceptible to radical polymerization, in the presence of at least one monomer selected from the group consisting of carboxylic acid monomers represented by the general formula (I):



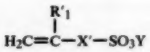
(I)

wherein R_1 and R_2 are H, C_1–C_{15} alkyl group, COOY where Y is H, NH_4, or alkali metal atom, halogen atom, phenyl group, or substituted phenyl group; R_3 is H, C_1–C_{15} alkyl group, halogen atom, phenyl group, or substituted phenyl group; and X is H, NH_4, or alkali metal atom, or by the general formula (II):



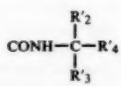
(II)

wherein R_4 and R_5 are H, C_1–C_{15} alkyl group, halogen atom, phenyl group, or substituted phenyl group, and sulfonic acid monomers or sulfonate monomers represented by the general formula (III):



(III)

wherein R'_1 is H, C_1–C_{20} alkyl group, phenyl group, substituted phenyl group, or halogen atom; X' is CONH,



where R'_2 and R'_3 are H or C_1–C_{15} alkyl group, and R'_4 is C_1–C_{15} alkylene group, $COO(CH_2)_m$ where m is an integer of 1 to 20, or $(CH_2)_n$ where n is an integer of 0 to 20; and Y is H, NH_4, or alkali metal atom, in an aqueous polymerization system containing the inorganic substance dispersed therein, said composition further comprising at least one of silane, titanate, aluminate and zircoaluminate coupling agents in an amount of 0.01 to 10 wt. % based on the total weight of the composition.

4,678,820
AMORPHOUS HYDRATED METAL OXIDE PRIMER FOR COMPOSITE FIBERS

Roscoe A. Pike, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 9, 1985, Ser. No. 774,257
Int. Cl.[4] C08K 7/04, 3/04
U.S. Cl. 523—200 6 Claims

1. A fiber reinforced polymeric matrix composite material wherein the improvement comprises:

(a) utilizing as the fiber reinforcement fibers having a layer thereon the layer of amorphous hydrated metal oxide formed by deposition onto the fiber and subsequent hydrolysis of a layer of M_xOR_y where

(i) x is 1;

(ii) y is 3 or 4;

(iii) M is any metal capable of forming a stable alkoxide; and

(iv) R is an organic radical;

resulting in a composite having wet strength retention.

4,678,821

COMPOSITES

Francis M. Logullo, Sr., Hockessin, Del.; Yun-Tai Wu, Newtown Square, Pa., and George E. Zahr, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1985, Ser. No. 739,861

Int. Cl.[4] C08K 9/00

U.S. Cl. 523—205 4 Claims

1. A rigid composite comprising an epoxy resin matrix reinforced with continuous p-aramid filaments coated with from about 0.2 to 2 percent by weight of a solid adhesion modifier, said coated filaments when embedded in an epoxy matrix and tested in accordance with ASTM D234476 exhibit a short beam shear strength of between about 2.5 and 5.5 Kpsi.

4,678,822

RESIN IMPREGNATED FIBRE BATT

Richard L. Lewellin, Somerville, Australia, assignor to Maxwell Victor Lane and George Kaddis, both of Dandenong, Australia

Continuation-in-part of Ser. No. 623,094, Jun. 21, 1984, abandoned. This application Oct. 31, 1985, Ser. No. 793,348

Int. Cl.[4] C04B 43/00, 43/12; C09K 3/28; A01N 25/34

U.S. Cl. 524—12 12 Claims

1. A method for forming a batt of bonded fibers for use as thermal insulation, which comprises the steps of:

(a) ragging, teasing and doffering fibers which include from an amount from 0 to 95% wool, together with fibers selected from the group consisting of monoacrylic, acrylic, polyamide, polyester and natural fibers;

(b) forming a sliver of randomly dispersed fibers;

(c) feeding the sliver onto a lapper;

(d) oscillating the lapper at a rate which will deliver the sliver to a conveyor on which the sliver is lapped into a multi-layered matt;

(e) oscillating a spray boom in sequence with the oscillating sliver to maintain the spray boom at the same distance from said sliver at all times as the sliver is delivered from the lapper;

(f) providing a second boom, which emits a cushion of air against said sliver on the side of said sliver opposite said spray boom to maintain the sliver in correct alignment with the conveyor;

(g) supplying a resin-emulsion comprising a fireproofing resin, a smoke retardant and pesticide to said spray boom;

(h) spraying said oscillating sliver with said resin-emulsion so that the matt formed by the lapped sliver is thoroughly impregnated with said resin-emulsion,

(i) conveying the impregnated matt to a drying means;

(j) evaporating or removing up to 80% of the water content of said matt while maintaining the temperature of the matt below the minimum temperature at which the fiber is substantially unimpaired by heat;

(k) curing the resin content of the matt to form a substantially rigid matt; and

(l) cutting the matt to form batts of desired length.

4,678,823

ASPHALT COMPOSITIONS CONTAINING SPURTED POLYOLEFIN FIBERS WITH IMPROVED DISPERSIBILITY IN HYDROCARBONS

Harold Jabloner, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 586,891, Mar. 12, 1984, which is a continuation of Ser. No. 365,719, Apr. 5, 1982, abandoned. This application Jun. 2, 1986, Ser. No. 869,553

Int. Cl.[4] C08L 95/00

U.S. Cl. 524—62 11 Claims

1. In a cutback asphalt composition comprising asphalt and a hydrocarbon solvent, the improvement wherein the composition also comprises a water-dispersible spurted polyolefin pulp having precipitated thereon a natural rubber or synthetic elastomer that is swellable in hydrocarbon solvents.

4,678,824

REMOISTENABLE ADHESIVE COMPOSITIONS

Vincent A. Lauria, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 13, 1986, Ser. No. 829,599

Int. Cl.[4] C08L 3/02; C08J 3/02; C09J 3/06

U.S. Cl. 524—48 7 Claims

1. Remoistenable adhesive compositions comprising at least 15% by weight of a dextrin emulsified ethylene vinyl acetate resin latex having a Tg of at least 0° C., 0.5–5% humectant, and sufficient phosphoric acid to lower the pH to about 2; the remainder of the composition comprising water and optional post-added dextrin.

4,678,825

STABILIZATION OF AROMATIC POLYESTERS WITH DIMERCAPTOTHIADIAZOLE

Jerold C. Rosenfeld, Tonawanda, N.Y., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 25, 1986, Ser. No. 833,921

Int. Cl.[4] C08K 5/34

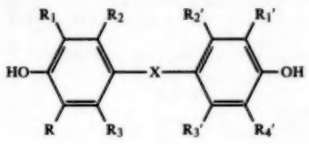
U.S. Cl. 524—83 21 Claims

1. A resin composition comprising:

(A) an aromatic polyester produced by polymerization of a substantially equimolar mixture of the monomeric components

(a) terephthalic acid and/or an acid halide, dialkyl ester or diaryl ester thereof and/or isophthalic acid and/or an acid halide, dialkyl ester or diaryl ester thereof, with the terephthalic acid unit/isophthalic acid unit mole ratio being about 9:1 to about 1:9, and

(b) at least one bisphenyl of the general formula (I)



(I)

wherein —X— is selected from the group consisting of —O—, —S—, —SO_2—, —SO—, —CO—, an alkylene group containing 1 to 4 carbon atoms or an alkylidene group containing 1 to 4 carbon atoms, and R_1, R_2, R_3, R_4, R_1', R_2', R_3', and R_4', which may be the same or different, each is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom or an alkyl group containing 1 to 4 carbon atoms, or a metal salt or diester of said bisphenol of the general formula (I), and

(B) about 0.01 to less than about 2% by weight, based on the aromatic polyester (A) of a stabilizer comprising 2,5(dimercapto)-1,3,4-thiadiazole.

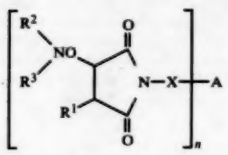
4,678,826

SUBSTITUTED-(AMINOXY)-PYRROLIDINE-2,5-DIONE STABILIZERS

Stephen D. Pastor, Yonkers, N.Y., and Edward T. Hessell, Norwalk, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 24, 1986, Ser. No. 822,179
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—104 **25 Claims**

1. A compound of the formula



wherein

R^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^2 and R^3 independently are hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms;

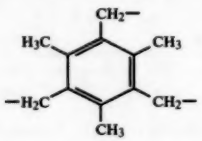
X is a direct bond or phenyl;

n is 1–3;

A, when n is 1, is hydrogen, alkyl of 1 to 30 carbon atoms, aryl, cycloalkyl of 5 to 8 carbon atoms, aralkyl of 7 to 9 carbon atoms, said aralkyl substituted by alkyl of 1 to 30 carbon atoms or 2,5-dioxo-1H-pyrrole;

A, when n is 2, is alkylene of 1 to 12 carbon atoms, phenylene, cycloalkylene of 6 to 10 carbon atoms or alkylenearylenealkylene of 8 to 10 carbon atoms; and

A, when n is 3, is alkanetriyl of 3 to 6 carbon atoms or



4,678,827

FLAME-RETARDANT SILICONE RUBBER COMPOSITION

Kunio Itoh; Kiyoshi Imai; Takeo Yoshida, and Motoo Fukushima, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,260
Claims priority, application Japan, Apr. 2, 1985, 60-69549
Int. Cl.[4] C08K 5/54
U.S. Cl. 524—188 **3 Claims**

1. A flame-retardant silicone rubber composition which comprises:

(a) 100 parts by weight of an organopolysiloxane represented by the average unit formula $R_aSiO_{(4-a)/2}$, in which R is a monovalent hydrocarbon group and the subscript a is a positive number in the range from 1.90 to 2.05;

(b) from 20 to 200 parts by weight of a finely divided silica filler;

(c) platinum or a platinum compound in an amount from 1 to 200 ppm by weight as platinum based on the amount of the component (a);

(d) an organosilicon compound having at least one nitrogen-containing organic group and at least one aliphatically unsaturated group in a molecule in such an amount that 1 to 500 moles of nitrogen atoms are provided per mole of the platinum in the component (c); and

(e) an organic peroxide or an organohydrogenpolysiloxane curing agent.

4,678,828

VIBRATION-DAMPING RUBBER COMPOSITION

Tsutomu Nakamura, Takasaki, and Kiyoshi Imai, Annaka, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,418
Int. Cl.[4] C08K 5/24; C08L 43/00
U.S. Cl. 524—265 **3 Claims**

1. A vibration-damping rubber composition which comprises:

(a) 100 parts by weight of a synthetic rubbery polymer;

(b) from 10 to 100 parts by weight of a finely divided siliceous powder having a specific surface area of at least 50 m^2/g; and

(c) from 3 to 20 parts by weight of a diorganopolysiloxane terminated at both molecular chain ends with a silanolic hydroxy group and represented by the formula

$$HO—SiMePh—O)_m(SiMe_2—O)_nH$$

in which Me is a methyl group, Ph is a phenyl group, the subscript m is a positive integer not larger than 20 and the subscript n is zero or a positive integer not larger than 20 with the proviso that m+n is 2 or larger.

4,678,829

METAL CONTAINER COATING COMPOSITIONS COMPRISING STABLE EMULSIONS OF WATER RESISTANT POLYVINYL ALCOHOL-STABILIZED VINYL CHLORIDE-ETHYLENE COPOLYMERS

John G. Iacoviello, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 622,592, Jun. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 572,726, Jan. 20, 1984, abandoned. This application Jun. 20, 1985, Ser. No. 747,134
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[4] C08F 2/16; C08K 3/20
U.S. Cl. 524—459 **10 Claims**

1. A metal container coating composition comprising

(a) about 45 to 95 wt% of a stable aqueous vinyl chloride-ethylene copolymer emulsion, the copolymer having a T_g from 0° to 50° C., consisting of (i) about 65 to 90 wt% vinyl chloride and (ii) ethylene, and prepared by emulsion polymerization of vinyl chloride monomer and ethylene in the presence of an emulsifying system consisting essentially of about 3 to 15 wt% polyvinyl alcohol which is 70 to 91 mole% hydrolyzed, which emulsion polymerization process comprises

forming an aqueous emulsion reaction mixture in a reaction vessel containing substantially all the polyvinyl alcohol and at least 5% to no more than about 60% of the total vinyl chloride monomer,

pressurizing the reaction mixture with an ethylene pressure sufficient to provide the copolymer with the requisite ethylene content,

initiating the reaction mixture by the addition of a free radical generating source and continuing polymerization until the rate of polymerization begins to decrease,

adding the remaining vinyl chloride monomer over a period of time while continuing polymerization until the reaction is no longer self-sustaining, and

removing the unreacted ethylene and reducing the vinyl chloride free monomer content of the emulsion,

(b) about 5 to 40 wt%, based on emulsion solids, of a cross-linking resin,

(c) up to about 10 wt% organic cosolvent, and

(d) 0 to 5 wt% acid catalyst.

4,678,830

TIRE TREAD RUBBER COMPOSITION

Susumu Sato, Tokyo, and Keizo Okamoto, Higashikurume, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,059

Claims priority, application Japan, Apr. 5, 1985, 60-71066

Int. Cl.[4] C08L *7/00, 9/00;* **C08K** *3/04*

U.S. Cl. 524—495 **1 Claim**

1. A rubber composition characterized in that with respect to 100 parts of natural rubber alone or a blend rubber consisting of natural rubber and not more than 50% by weight of at least one kind of a diene base synthetic rubber, carbon black having the following properties is blended in an amount from 35 to 55 parts by weight:

(a) A nitrogen adsorption specific surface area (N_2SA) of from 115 to 135 m^2/g,

(b) A strength (ΔDBP) of the agglomerates defined by the following formula of not more than 18 ml/100 g,

$$\Delta DBP(\text{ml}/100\text{ g}) = DBP - 24M4DBP$$

(c) An oil absorption at 24M4DBP of from 95 to 110 ml/100 g,

(d) A ratio of the nitrogen adsorbing specific surface area (N_2SA) (m^2/g) to the iodine adsorbing specific surface area (IA) (mg/g) of from 1.05 to 1.20,

wherein said composition has a rubber hardness of 55 to 67.

4,678,831

BLOCK COPOLYMERS AND RESIN COMPOSITIONS

Juheiji Kawabata; Toshinori Sugie, both of Takaishi; Fumihiro Kobata, Izumi, and Akira Hirayama, Chiba, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

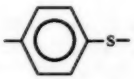
Filed Mar. 28, 1986, Ser. No. 845,455

Claims priority, application Japan, Mar. 30, 1985, 60-67726; Apr. 26, 1985, 60-90678; Nov. 19, 1985, 60-257870; Nov. 22, 1985, 60-261309

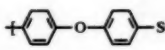
Int. Cl.[4] C08K *3/04*

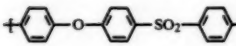
U.S. Cl. 524—496 **10 Claims**

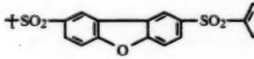
1. A block copolymer comprising 1 to 99% by weight of a polyphenylenesulfide portion and 99 to 1% by weight of a polysulfone portion, and having a logarithmic viscosity [η] in the range of 0.03 to 1.0, said polyphenylenesulfide portion containing at least 70 mol% of structural units represented by the formula



and having a logarithmic viscosity [η] in the range of 0.03 to 0.80, said polysulfone portion having a structural formula selected from the group consisting of







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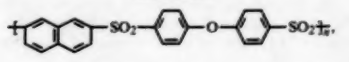
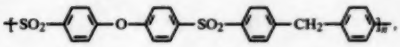
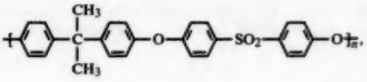
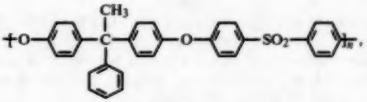
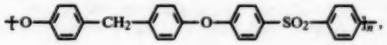
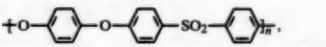


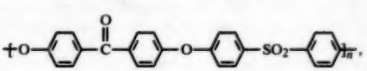


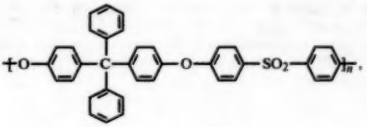


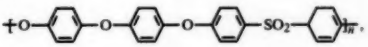


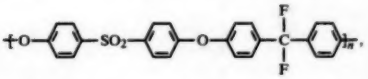


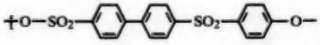


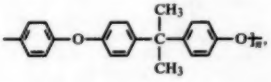


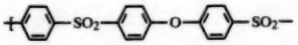


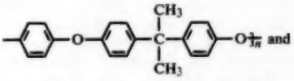


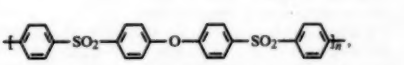












wherein n is an integer of 10 more, and having a reduced viscosity [η_{sp}/C] in the range of 0.05 to 1.0, said logarithmic viscosity [η] being a value calculated by the equation

$$[\eta] = \ln(\text{relative viscosity})/\text{polymer concentration}$$

from a relative viscosity measured at 206° C. for a solution of a polymer in α-chloronaphthalene in a polymer concentration of 0.4 g/100 ml, and said reduced viscosity [η_{sp}/C] being a value calculated by the equation

$$[\eta_{sp}/C] = \frac{\text{(relative viscosity-1)}}{\text{polymer concentration}}$$

from a relative viscosity measured at 25° C. for a solution of a polymer in chloroform in a polymer concentration of 0.2 g/100 ml.

4,678,832

HOT-MELT ADHESIVES OF PARTIALLY SAPONIFIED VINYL ESTER COPOLYMERS

Günther Pospich, and Richard Gutte, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 479,890, Mar. 29, 1983, abandoned. This application Nov. 1, 1984, Ser. No. 667,069

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211915

Int. Cl.[4] C08F *16/06*

U.S. Cl. 525—60 **23 Claims**

1. A process for preparing hot-melt adhesive based on polyvinyl alcohol by alcoholyzing a vinyl ester polymer while stirring it in solution in the presence of a basic catalyst, which comprises:

subjecting a vinyl ester copolymer (dissolved in solvent) to alcoholysis with a lower alcohol until a completely homogeneous, admixture results with a polyvinyl alcohol which has an average degree of hydrolysis of from 50 to 70 mole precent, and thereafter removing the solvent therefrom;

the copolymer being that of vinyl acetate and a comonomer of the formula

$$CH_2=\underset{\displaystyle R^1}{\overset{|}{C}}-R^2$$

in which R^1 denotes a hydrogen atom (—H) or a methyl radical and

R^2 represents (a) an alkylcarbonyloxy radical having from 3 to 18 carbon atoms, (b) an alkoxy radical having from 1 to 4 carbon atoms, (c) a nitrile group, (d) a hydrogen atom (—H), (e) a hydrocarbon radical having from 1 to 8 carbon atoms or (f) a vinyl radical,

and having a weight average molecular weight within the range of from 60,000 to 400,000;

said copolymer optionally being in admixture with a vinyl ester homopolymer which has a weight average molecular weight within the range of from 30,000 to 200,000; and

the copolymer having therein an amount of comonomer which is from 0.5 to 2 percent by weight based on said copolymer and any homopolymer (prior to alcoholysis).

4,678,833

MISCIBLE POLYMER BLENDS CONTAINING POLY(2-ALKYL-2-OXAZOLINE)

Kathleen M. McCreedy, Midland, Mich.; Henno Keskkula, Austin, Tex.; James C. Pawloski, Bay City, and Edward H. Yonkers, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 736,591, May 21, 1985, abandoned, which is a division of Ser. No. 552,211, Nov. 15, 1983, Pat. No. 4,547,580. This application Jun. 19, 1986, Ser. No. 876,025

Int. Cl.[4] C08L *51/04, 79/04*

U.S. Cl. 525—66 **13 Claims**

1. A blend of polymeric components comprising a polymer of a 2-oxazoline and at least one water-insoluble thermoplastic polymer which is not a polymer of 2-oxazoline and which other polymer is miscible with said 2-oxazoline polymer in the relative proportions thereof present in said polymeric composition, wherein the weight ratio of said 2-oxazoline polymer to said thermoplastic polymer in said composition is from about 19:1 to about 1:19 and the blend exhibits a single glass transition temperature.

4,678,834

BLENDS OF POLYOLEFINS WITH POLYMERS CONTAINING REACTIVE AGENTS

Daniel W. Boivin, Toronto, and Ronald A. Zelonka, Kingston, both of Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Jul. 18, 1985, Ser. No. 756,223

Claims priority, application Canada, Jun. 27, 1985, 485651

Int. Cl.[4] C08L *23/26;* C08K *5/14;* C08J *3/24, 5/00*

U.S. Cl. 525—74 **30 Claims**

1. A mixture comprising, in physical admixture, a major portion of particles of a polyeth/ylene and a minor portion of particles of a composition of a second polymer, in which the polyethylene is selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and at least one C_4–C_{10} higher alpha-olefin, and mixtures thereof, and said second polymer is a normally solid thermoplastic polymer having a melting point of less than 185° C. and a shear viscosity that is not more than 30% of that of said polyethylene when measured at 200° C. and a shear rate of 400 sec^{-1}, with the proviso that said second polymer is not homopolymer or copolymer derived solely from hydrocarbon alpha-olefin having 2–10 carbon atoms, and said composition being a composition of the second polymer and a cross-linking agent said cross-linking agent being capable of reacting with said polyethylene in a molten state, the ratio of the polyethyelene to the second polymer being in the range of from 10:1 to 100:1.

4,678,835

COATING COMPOSITION CONTAINING AN UNGELLED REACTION PRODUCT AS A CURATIVE

Wen-Hsuan Chang, Gibsonia; Edward L. Dufford, Sarver; J. Alden Erikson, Gibsonia, and Paul J. Prucnal, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1986, Ser. No. 824,040

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—100 **30 Claims**

1. A coating composition comprising at least 40 percent by weight of an ungelled reaction product of

(i) at least 2 percent by weight of an amine having in a molecule thereof at least one amino hydrogen atom, and at least one silicon atom directly bonded to a hydrolyzable group;

(ii) at least 4 percent by weight of a material containing at least one epoxide group, at least 30 percent of said epoxide group containing material being essentially free of hydroxyl groups; and

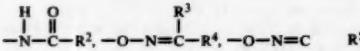
(iii) a material selected from vinylalkoxysilanes; nonfunctional organosilanes which are represented by the following structural formula:

$$\underset{\displaystyle Si-X_{4-m}}{\overset{\displaystyle R^{12}_m}{|}}$$

wherein

R^{12} is hydrogen, alkyl, aryl, alkylaryl, arylalkyl, or aryloxyalkyl;

X is —OR^1,



and the monohydroxyl cyclic C_2-C_3 residue of a 1,2- or 1,3-glycol, wherein

R^1 is C_1–C_3 alkyl,

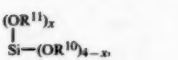
R^2 independently is H or C_1–C_4 alkyl,

R^3 and R^4 independently are H, C_1–C_4 alkyl, C_6–C_8 aryl, and

R^5 is C_4–C_7 alkylene, and

m is an integer ranging from 1 to 2;

organosilicates which are represented by the following structural formula:



wherein

R^{10} is C_1 to C_3 alkyl;

R^{11} is an alkyl radical having at least 4 carbon atoms, aryl, alkylaryl, arylalkyl, aryloxyalkyl, or alkyloxyalkyl and x is an integer from 0 to 2;

and partial hydrolysis products thereof; the percentages by weight being based on the total weight of the resin solids of the coating composition including (i), (ii), and (iii).

4,678,836

BLENDS OF ETHYLENE/ACRYLIC ACID COPOLYMERS WITH LINEAR LOW DENSITY POLYETHYLENE

Osborne K. McKinney; James A. Allen, and David P. Flores, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 567,721, Jan. 3, 1984, abandoned. This application Sep. 20, 1985, Ser. No. 777,997

Int. Cl.[4] C08L *23/18, 33/02, 23/08*

U.S. Cl. 525—221 **20 Claims**

1. A homogeneous binary blend of an ethylene polymer and an ethylene/acrylic acid interpolymer, wherein the blend consists of between 80% to about 99% of the ethylene/acrylic acid interpolymer, the remainder being said ethylene polymer,

said ethylene polymer being characterized as a linear low density ethylene interpolymer, prepared using a coordination catalyst acting as a polymerization initiator in the interpolymerization of ethylene with at least one alpha-olefin comonomer having from 3 to about 12 carbon atoms in each comonomer unit, the amount of said comonomer being an amount sufficient to constitute about 3% to about 20% by weight of the interpolymer and also sufficient to impart a low density in the range of about 0.90 up to about 0.94 gms/cc to the interpolymer, said interpolymer being further characterized as having a melt flow value of from about 0.1 gm/10 min. as measured by ASTM D-1238 (Condition E) to about 50 gm/10 min. as measured by ASTM D-1238 (Condition D),

said ethylene/acrylic acid interpolymer being characterized as a random interpolymer prepared at high pressure by the action of a free-radical polymerization initiator, acting on a mixture of ethylene monomer and acrylic acid monomer, said random interpolymer being further characterized as containing about 0.5 to about 50 weight percent of the acrylic acid moiety, the remainder being the ethylene moiety, a density in the range of about 0.91 to about 1.3 gms/cc, and a melt flow value of from about 150 gm/10 min. as measured by ASTM D-1238 (Condition B) to about 0.1 gm/10 min. as measured by ASTM D-1238 (Condition E).

4,678,837

MULTILITHIUM POLYMERIZATION INITIATORS

Paul A. Mancinelli, Aston, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 23, 1985, Ser. No. 768,670

Int. Cl.[4] C08F *2/00, 297/04*

U.S. Cl. 525—250 **8 Claims**

1. A process for forming star-block copolymers having a pre-determined number of arms, consisting essentially of

(a) oligomerization of 3 to 6 moles of a polyvinyl aromatic compound using one mole of a first organomonolithium initiator to form a mini-block having a pred-determined number from 3 to 6 of pendant vinyl groups;

(b) activation within 5 to 20 seconds of the pendant vinyl groups by the addition of stoichiometric amounts of a second organomonolithium initiator to form a multilithium initiator having pre-determined number of active sites;

(c) addition of 0–100% by weight based on total monomer of conjugated diene monomer and/or 100–0% by weight based on total monomer of vinyl aromatic monomer to form a star-block block copolymer; and

(d) termination of the copolymer to recover said star-block copolymer.

4,678,838

PARTICULATE HYDROPEROXIDIZED POLY-N-VINYL LACTAM, ITS PREPARATION AND USE THEREOF

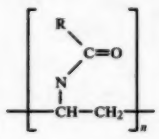
Robert A. Janssen, Alpharetta, Ga., assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,535

Int. Cl.[4] C08F *8/06*

U.S. Cl. 525—326.9 **6 Claims**

1. A particulate hydroperoxidized derivative of a poly-N-vinyl lactam containing units of the formula



(I)

where R is alkylene of 2 to 8 carbon atoms, n is about 40 to about 4000, and wherein said derivative contains an average of between about 0.5 to about 20 hydroperoxy equivalents per mole of poly-N-vinyl lactam; said derivative being the result of the process comprising contacting a particulate polymer having units of formula I with ozone.

4,678,839

MIXTURES INCLUDING POLYPHENYLENE ETHERS AND LACTAMS AND RESINOUS COMPOSITIONS PREPARED THEREFROM

John E. Hallgren, Scotia; Peter P. Policastro, Schenectady; Herbert S. Chao, Watervliet, and Bruce C. Johnson, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 8, 1985, Ser. No. 752,744

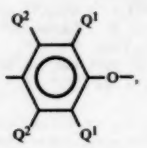
Int. Cl.[4] C08L *71/04*

U.S. Cl. 525—390 **23 Claims**

1. A polymerizable composition comprising a mixture of:

at least one lactam;

at least one polyphenylene ether resin consisting essentially of structural units having the formula



(I)

wherein in each of said units independently, each Q^1 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, aminoalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms; and each Q^2 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, hydrocarbonoxy or halohydrocarbonoxy as defined for Q^1; and grafted and coupled derivatives thereof; and

a lactam polymerization catalyst.

4,678,840

PHOSPHONIC ACID-CONTAINING POLYMER

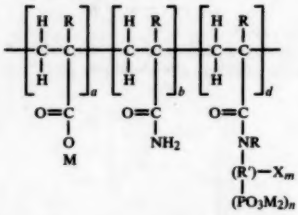
Dodd W. Fong, Naperville, and David J. Kowalski, LaGrange Park, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 24, 1986, Ser. No. 831,962

Int. Cl.[4] C08F *8/40*

U.S. Cl. 525—340 **14 Claims**

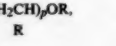
1. A process to synthesize water-soluble phosphonated polymer having randomly repeated mer units represented by the formula:



wherein

R′ is a multi-covalent hydrocarbonaceous bridging group having from one to sixteen carbon atoms and being chosen from bridging groups which are linear alkyl, branched alkyl, cyclic, alkaryl, arylalkyl, aromatic, heterocyclic, olefinic or mixtures thereof;

X is chosen from Cl, Br, I, —COOM, —SO_3M, —OR,



or mixtures thereof;

R is individually chosen at each occurrence from H or lower alkyl (C_1–C_4) groups;

M is chosen from hydrogen, lower alkyl (C_1–C_4) groups, alkali metal, an equivalent amount of alkaline earth metals, tertiary amines, quaternary amines, ammonium ion, or mixtures thereof;

and wherein,

a, b, and d are integers with the following relationships;

a/b is from zero to 100

b/d is from 0.01 to 100

a/d is from zero to 100,

and the sum of a+b+d is sufficient to provide a weight average molecular weight of at least 500,

and the ratio of d:(a+b) is from 100:1 to 1:100;

and wherein

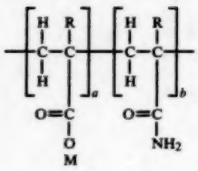
p ranges between 1 and 16,

m ranges between 0 and 16, and

n ranges between 1 and 16, provided that when m is zero, the sum of m+n is from 1 to 20;

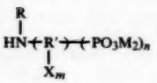
which process comprises reacting, in a common solvent, at a temperature of at least 100° C.;

A. a polymer having a weight average molecular weight of at least 500, and having pendant amide functional groups, and represented by the structure:



wherein R, M, a, b have the same meanings as above; with

B. a chemical reactant having the structure:



wherein R, R′, M, X, m, and n have the meanings above; and wherein the mole ratio of chemical reactant to pendant amide groups in the polymer ranges between about 5:1 to about 1:100; and reacting for an effective amount of time to accomplish at least a 25 percent conversion of chemical reactant to phosphonated pendant groups on the polymer; and then recovering the water-soluble phosphonated polymer.

4,678,841

METHOD OF PRODUCING A CYCLIZED POLYDIENE

Tamae Yoshizawa; Kiyoto Otsuka; Shiro Nagata, all of Kurashiki, and Hideo Takamatsu, Hasaki, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Mar. 4, 1985, Ser. No. 707,843

Claims priority, application Japan, Mar. 5, 1984, 59-42434; Jul. 13, 1984, 59-146554; Jan. 14, 1985, 60-4461

Int. Cl.[4] C08F *8/48*

U.S. Cl. 525—353 **16 Claims**

1. A method for producing a cyclized polydiene, comprising cyclizing a polydiene which is at least one member selected from the group consisting of polyisoprenes and polybutadienes, wherein the said polydiene has a weight average molecular weight of from 10,000 to 1,000,000, and wherein the said cyclizing is performed in an organic solvent in the presence of a binary catalyst which comprises a Lewis acid which is at least one member selected from the group consisting of tin halides and titanium halides and a Bronsted acid which is at least one member selected from the group consisting of sulfonic acids of the generic formula R—SO_3H, where R is a $C_{1\text{-}10}$ alkyl or a $C_{6\text{-}10}$ aryl group.

4,678,842

POLY(FLUOROACETYLENE) CONTAINING POLYMERS

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

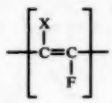
Filed Nov. 29, 1984, Ser. No. 676,122

Int. Cl.[4] C08F *8/26*

U.S. Cl. 525—359.1 **6 Claims**

1. A process for dehydrofluorinating a fluorine substituted polymer to provide a dehydrofluorinated polymeric composi-

tion which comprises treating a starting polymer selected from the group of starting polymers consisting essentially of a homopolymer of vinylidene fluoride monomeric units or trifluoroethylene monomeric units, copolymers or terpolymers containing a major portion of vinylidene fluoride monomeric units with at least one copolymerized monomeric unit selected from the group consisting essentially of hexafluoropropylene, trifluoroethylene, vinyl fluoride, vinyl chloride, chlorotrifluoroethylene, and mixtures of the homopolymer, copolymer, and terpolymer; with a basic solution containing alkali hydroxides, organic amines, or quaternary ammonium hydroxides of pH 10 to 14 at a temperature within the range of 20° C. to 100° C. for a sufficent period of time of at least 5 minutes to remove HF from the polymer to provide a dehydrofluorinated polymer having at least 5 monomeric mol percent of the dehydrofluorinated unit



wherein X is H or F and the dehydrofluorinated units form conjugated double bonds that impart electrical conductivity to articles prepared from the dehydrofluorinated polymer.

4,678,843

PROCESS FOR THE AMMONIUM HYDROXIDE HYDROLYSIS OF POLYMERS OF ACETOXYSTYRENE TO POLYMERS OF VINYLPHENOL

Jimmy D. Elmore, and Elizabeth S. Goff, both of Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 29, 1986, Ser. No. 912,039
Int. Cl.[4] C08F *8/12*
U.S. Cl. 525—378 **16 Claims**

1. A process which comprises:

a. reacting a polymer of 4-acetoxystyrene with ammonia at a temperature of about 50° C. to about 150° C. for a time sufficient to hydrolyze the acetoxy groups to phenol groups;

b. contacting the polymer with wet carbon dioxide gas at a temperature of about 110° C. to aabout 180° C. to form ammonium carbonate which immediately decomposes to ammonia, carbon dioxide and water; and

c. removing the decomposition products by sparging with nitrogen or by distillation.

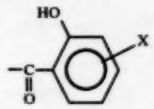
4,678,844

CHELATE, CROSSLINKED POLYETHYLENEIMINE RESIN HAVING 2-HYDROXY BENZOYL GROUP

Masako Sakuragi, Sakuramura, and Kunihiro Ichimura, Yatabemachi, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,346
Claims priority, application Japan, Mar. 4, 1985, 60-42490
Int. Cl.[4] C08G *73/00*; C08J *3/24*
U.S. Cl. 525—417 **5 Claims**

1. A chelate resin, comprising a high molecular compound of granules of cross-linked polyethyleneimines obtained by suspending an aqueous polyethyleneimine solution in an organic solvent and cross-linking and insolubilizing said polyethyleneimine by addition of a cross-linking agent to the resultant suspension, said resin having a 2-hydroxybenzoyl group of the general formula:



wherein X stands for one member selected from the class consisting of hydrogen atom, hydroxyl group, and nitro group linked to the nitrogen atom in the imine chain of said high molecular compound.

4,678,845

MIXED POLYCARBONATE RESIN COMPOSITION

Masayoshi Takamatsu, Hino; Kouji Hashimoto, Matsuyama; Akiyoshi Manabe, Matsuyama, and Hideyuki Ichihana, Matsuyama, all of Japan, assignors to Teijin Chemicals, Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,169
Claims priority, application Japan, May 17, 1984, 59-97516
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—462 **13 Claims**

1. A composition comprising a blend of

(A) 1 to 70% by weight of polycarbonate resin derived from 2,2-bis(4-hydroxyphenyl)propane based on the total weight of (A) and (B), and

(B) 30 to 90% by weight of a polycarbonate resin derived from 1,1-bis(4-hydroxyphenyl)ethane based on the total weight of (A) and (B).

4,678,846

ACRYLATE OR METHACRYLATE-ESTER-MODIFIED ORGANOPOLYSILOXANE MIXTURES, THEIR PREPARATION AND USE AS ABHESIVE COATING COMPOSITIONS

Christian Weitemeyer, Essen, and Jürgen Jachmann, Herne, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Filed Jul. 15, 1985, Ser. No. 755,281
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1984, 3426087
Int. Cl.[4] C08L *83/07*; C08F *230/08*
U.S. Cl. 525—477 **14 Claims**

1. Mixtures of compounds which are acrylate or methacrylate ester modified organopolysiloxane mixtures with improved adhesive properties comprising a mixture of essentially equilibrated organopolysiloxanes with, on the average, a first fraction containing more than 25 to less than 200 silicon atoms, and 2 to 30 weight percent of a second fraction of organopolysiloxanes with, on the average, 2 to 25 silicon atoms, and 2 to 30 weight percent of a third fraction of organopolysiloxanes with, on the average 200 to 2,000 silicon atoms.

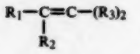
4,678,847

PROCESS FOR PREPARING A TERPOLYMER OF TETRAFLUOROETHYLENE, ETHYLENE AND A THIRD MONOMER

Yun-xiang Zhang; Xing-yi Dai; Zhi-kang Lu, and Sen Zeng, all of Shanghai, China, assignors to Shanghai Institute of Organic Chemistry, Academia Sinica, Shanghai, China

Filed Apr. 1, 1986, Ser. No. 846,795
Claims priority, application China, Apr. 1, 1985, 85100468
Int. Cl.[4] C08F *2/14*
U.S. Cl. 526—206 **21 Claims**

1. A process for preparing a terpolymer by solution precipitation comprising reacting tetrafluoroethylene, ethylene and a third monomer having the formula CF_2XCOCF_2X' or



wherein X=X'=Cl or F, R_1=CF_3 or CH_3, R_2=CH_3, CH_3 or H and R_3=H, F or a mixture thereof to form the terpolymer, said reacting being conducted in a reaction medium comprised of 1,1,2-trichloro-1,2,2-trifluoroethane and in the presence of a gaseous telomeric agent in an amount sufficient to control the average molecular weight of the terpolymer, said gaseous telomeric agent having the molecular formula C_nR_{2n+2} wherein n=0, 1 or 2, and R=H, Cl, F or a mixture thereof provided that said gaseous telomeric agent is not $CHCl_3$ or CCl_4.

4,678,848

PROCESS FOR PREPARING SULFUR-MODIFIED CHLOROPRENE POLYMERS

Henry C. Walter, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 117,504, Feb. 1, 1980, abandoned. This application Apr. 1, 1981, Ser. No. 249,907

Int. Cl.[4] C08F *8/34*

U.S. Cl. 526—220 **17 Claims**

1. A method of preparing sulfur-modified polychloroprene by copolymerization chloroprene with sulfur, in alkaline aqueous emulsion and in the presence of a free-radical initiator, an organic polysulfide selected from the class consisting of

(a) tetra-alkylthiuram disulfides in which the alkyl group contains from about 3 to 6 carbon atoms; and the said polysulfide is introduced before the initiation of the polymerization in proportions of between about 0.3 and 2 to 100 parts, by weight, of chloroprene charged.

4,678,849

HEAT-CURABLE MIXTURE CONTAINING SUBSTITUTED BICYCLO(2.2.1)HEPT-5-ENE-2,3-DICARBOXIMIDE AND POLYMALEIMIDE

Marie W. Liu, Fountain Valley, and Victor Ho, Huntington Beach, both of Calif., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 21, 1986, Ser. No. 831,687

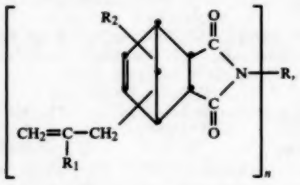
Int. Cl.[4] C08F *26/06*

U.S. Cl. 526—259 **18 Claims**

1. A heat-curable mixture comprising

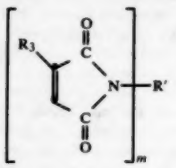
(a) at least one compound of formula I

(I)



(b) at least one compound of formula II

(II)



(c) at least one alkenyl phenol or alkenyl phenol ether, and

(d) triallylisocyanurate,

in which formulae (I) and (II) above

n is 1 or 2 and m is 2 or 3,

R wherein n is 1, is a hydrogen atom, C_1–C_{12}alkyl, C_3–C_6alkenyl, C_5–C_8cycloalkyl, C_6–C_{10}aryl or benzyl, or wherein n is 2, is $—C_pH_{2p}—$, wherein p is 2 to 20, or is C_6–C_{10}arylene or a group of the formula III

(III)

wherein

T is methylene, isopropylidene, —CO—, —O—, —S— or $—SO_2—$,

R' is an organic radical of valency m which contains 2 to 30 carbon atoms, and

R_1, R_2 and R_3 are each independently a hydrogen atom or a methyl group.

4,678,850

HALOGENATED POLYSTYRENES FOR ELECTRON BEAM, X-RAY AND PHOTO RESISTS

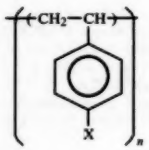
Michael Hatzakis, Chappaqua; John J. Liutkus, Yorktown Heights; Jurij R. Paraszczak, Ossining, all of N.Y., and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 373,839, May 3, 1982, abandoned. This application Oct. 19, 1984, Ser. No. 662,962

Int. Cl.[4] C08F *14/02, 14/16*

U.S. Cl. 526—293 **8 Claims**

1. A polymer useful in forming a negative lithographic resist mask, said polymer having the general formula



wherein X is chlorine, bromine or iodine, n represents a number in the range of from about 750 to about 7,500, wherein the molecular weight (Mw) of the polymer is in the range of from about 1×10^5 to about 1×10^6, the dispersivity (Mw/Mn) of the polymer is in the range of from about 1.5 to about 2.5 and the contrast is about 3.5.

4,678,851

METAL DYE COMPLEXES CONTAINING AN AZO OR AZOMETHINE DYE AND A COLORLESS LIGAND WITH THE C=N—N=C GROUP

Gerhard Back, Lörrach, Fed. Rep. of Germany; Hans U. Schütz, Basel, Switzerland, and Ulrich Schlesinger, Binzen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

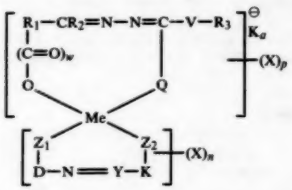
Filed Mar. 28, 1985, Ser. No. 717,743

Claims priority, application Switzerland, Apr. 6, 1984, 1750/84

Int. Cl.[4] C09B 62/012, 62/032, 62/095, 62/477

U.S. Cl. 534—619 19 Claims

1. A chromium or cobalt complex of the formula



wherein

D is a benzene, naphthalene or heterocyclic radical of a diazo component;

Y is nitrogen or —CH;

K is a radical of a coupling component if Y is nitrogen, or an o-hydroxyaldehyde radical if Y is —CH;

Ka is a cation;

Me is chromium or cobalt;

Z_1 is —O— or —COO— ortho to N=Y

Z_2 is —O— or —NR vicinal to N=Y, wherein R is hydrogen, C_1–C_4 alkyl or phenyl;

X is a fiber reactive radical which is bound directly to or through an amino group to the complex and which contains removable substituents that react with hydroxyl groups in cellulosic or with the NH_2 groups in polyamide fiber materials;

R_1 is a direct bond or a C_1–C_8-alkyl, C_1–C_8-alkenyl, or aryl radical or heterocyclic radical containing 1 to 3 sulfur, oxygen or nitrogen atoms;

R_2 is hydrogen, C_1–C_8-alkyl or aryl;

R_3 is hydrogen, a C_1–C_8-alkyl, aryl or amino radical, or a heterocyclic radical containing 1 to 3 sulfur, oxygen or nitrogen atoms;

V is a direct bond or oxygen;

Q is oxygen or sulfur;

w is 0 or 1;

n is 0, 1, 2, 3 or 4, and

p is 0, 1, 2

with the proviso that the sum of n+p is at least 1.

4,678,852

PROCESS FOR REACTING CYANURIC CHLORIDE WITH AMMONIA OR WITH AMINES

Marianne Punzar, Bottmingen; Franz Marti, Dornach; Robert Mercier, Basel; Paul Tobler, and Rudolf Büttiker, both of Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 493,920, May 12, 1983, Pat. No. 4,552,959. This application Oct. 30, 1984, Ser. No. 710,621

Claims priority, application Switzerland, May 18, 1982, 3082/82; May 24, 1982, 3184/82

Int. Cl.[4] C07D 251/44, 251/50

U.S. Cl. 544—194 6 Claims

1. A process for reacting cyanuric chloride with ammonia or with amines by bringing melted cyanuric chloride into contact with an aqueous ammonia or amianes solution or suspension, which process comprises spraying through a nozzle, which is immersed in the liquid, melted cyanuric chloride, into an aqueous ammonia or amine solution or suspension.

4,678,853

1-(3,4-DIMETHYLBENZYL)-2-(N-ALKYL)-CARBAMOYL TETRAHYDROISO QUINOLINES

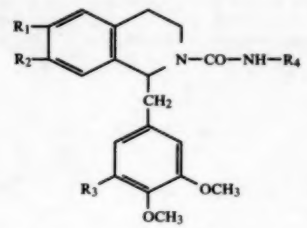
Chavdar B. Ivanov; Donka M. Mondeshka; Nikolina D. Berova; Rossitza S. Rakovska; Yordanka T. Panova; Marko T. Markov; Radi G. Ovcharov; Petko D. Usunov, and Orhideya B. Zabunova, all of Sofia, Bulgaria, assignors to T P O "Pharmachim", Sofia, Bulgaria

Filed Jan. 13, 1986, Ser. No. 818,489

Int. Cl.[4] C07D 217/06

U.S. Cl. 546—146 4 Claims

1. 1-benzyl-2-(N-substituted)-carbamoyl-tetrahydroisoquinoline of formula:



I

in which R_1 and R_2 are hydroxyl or methoxyl, R_3 is hydrogen or methoxy, R_4 is methyl or chloroethyl.

4,678,854

COBALT COMPLEXES AND THEIR USE AS NUTRITIONAL SUPPLEMENTS

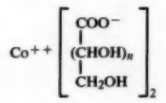
Mahmoud M. Abdel-Monem, St. Paul, Minn., assignor to Zinpro Corporation, Chaska, Minn.

Filed Nov. 25, 1986, Ser. No. 748,851

Int. Cl.[4] C07F 15/06

U.S. Cl. 556—149 5 Claims

1. Cobalt complex salts of the formula:



wherein n is from 1 to 5.

4,678,855

SUBSTITUTED BENZENESULFONAMIDES

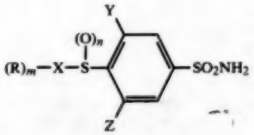
Kenneth L. Shepard, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 9, 1985, Ser. No. 785,924

Int. Cl.[4] C07C 149/443; A61K 9/06

U.S. Cl. 564—85 6 Claims

1. A compound of structural formula:



or an ophthalmologically acceptable salt thereof, wherein:

X is a straight, branched or cyclic, saturated hydrocarbon of up to 10 carbon atoms,

m is 1 or 2;

n is 0, 1 or 2;

R is

(1) —OH,

(2)

wherein R^1 is hydrogen or C_{1-4}alkyl,

(3)

(4) $-N(R^1)_2$ wherein the R_1 groups are the same or different, and if loweralkyl, can be joined together to form, with the nitrogen atom to which they are attached, a 5- or 6-membered heterocycle,

(5)

(6)

(7)

wherein M^+ is an ophthalmologically acceptable cation selected from sodium, potassium ammonium, tetra(C_{1-4}alkyl)ammonium, pyridinium, imidazolium, pralidoxime, and thiamine

(8)

wherein M^+ is as previously defined;

(9)

wherein R^4 is C_{1-3} alkyl or phenyl —C_{1-3} alkyl; or

(10)

wherein R^4 is as previously defined, and the two may be the same or different.

Y and Z are independently;

(1) hydrogen,

(2) halo, such as chloro, bromo, or fluoro,

(3) nitro,

(4) C_{1-5}alkanoyl,

(5) C_{1-5}alkyl,

(6) C_{1-5}alkylthio,

(7) C_{1-5}alkylsulfonyl, or

(8) amino.

4. An ophthalmic formulation for the treatment of elevated intraocular pressure comprising an ophthalmologically acceptable carrier and an effective intraocular pressure lowering amount of the compound of claim **1** or an ophthalmologically acceptable salt thereof.

4,678,856

METHOD OF MANUFACTURING AROMATIC URETHANE AND INTERMEDIATE PRODUCT THEREOF

Takao Ikariya, Tokyo; Masanori Itagaki, Yokohama; Masatsugu Mizuguchi, Kawasaki; Itaru Sakai, Yokohama, and Osamu Tajima, Kamakura, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1986, Ser. No. 902,527

Claims priority, application Japan, Sep. 4, 1985, 60-195306; Sep. 4, 1985, 60-195307; Sep. 4, 1985, 60-195308; Nov. 8, 1985, 60-250497; Nov. 8, 1985, 60-250499

Int. Cl.[4] C07C *125/065, 125/067, 125/073, 125/075*

U.S. Cl. 560—24 **9 Claims**

1. A method of manufacturing aromatic urethane, comprising:

the urea producing step of reacting an aromatic mononitrocompound, an aromatic primary amine, and carbon monoxide by using a catalyst having a platinum group metal-containing compound as a major constituent to prepare N,N′-di-substituted urea and of separating and recovering the resultant N,N′-di-substituted urea from a reaction solution;

the step of reacting the N,N′-di-substituted urea as an intermediate product prepared in the urea producing step with an organic compound containing a hydroxyl group to prepare an aromatic primary amine and aromatic urethane, and of separating the aromatic primary amine from the aromatic urethane, thereby obtaining the aromatic urethane; and

the step of recirculating the separated aromatic primary amine in the urea producing step.

6. A method of manufacturing ureas by reacting an aromatic primary amine, an aromatic nitro-compound, and carbon monoxide by using a catalyst essentially consisting of a platinum group metal-containing compound.

4,678,857

PROCESS FOR SEPARATION OF PRODUCT RESULTING FROM HYDROFORMYLATION

Roger G. Dureanleau, Georgetown, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,543

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 **10 Claims**

1. In a process for hydroformylation of allyl alcohol to 4-hydroxybutanal by reaction with carbon monoxide and hydrogen in the presence of a rhodium-containing catalyst with excess triphenylphosphine at a temperature in the range of from about 50° to 110° C. and at a pressure in the range from about 5 atm to 100 atm, the improvement comprising using a solvent from the group consisting of halogenated aromatic alkyl ethers, halogenated aromatics, halogenated ethers, halogenated aliphatic solvents, and aromatic solvents from the group consisting of benzene, toluene, tetralin and mixed xylenes which preferably exhibit a large density differential compared with water, thus allowing rapid separation of the aqueous phase and organic phase, as well as improved selectivity and yield of the desired 4-hydroxybutanal product.

4,678,858

PROCESS FOR PRODUCING ETHANOL

Nobuo Isogai; Takashi Okawa; Motoyuki Hosokawa; Tomoji Tsuji, and Natsuko Wakui, all of Niigata, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,008
Claims priority, application Japan, Jun. 10, 1985, 60-124268
Int. Cl.[4] C07C 29/00, 31/08
U.S. Cl. 568—902 9 Claims

1. A process for producing ethanol which comprises reacting methanol, carbon monoxide and water in the presence of a catalyst consisting of cobalt or a cobalt compound and a tertiary phosphine as an effective component, which catalyst has been preliminarily activated by heat-treating at 180°–280° C. and under 50–500 Kg/cm^{2}G in the presence of mixed gas comprising hydrogen and carbon monoxide, wherein the molar ratio of hydrogen to carbon monoxide is more than 0.25, and solvent, and in the substantial absence of methanol and water.

4,678,859

SYNTHESIS OF FLUOROCHLOROMETHANES

Charles G. Rudershausen, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1986, Ser. No. 889,468
Int. Cl.[4] C07C 17/24
U.S. Cl. 570—163 5 Claims

1. A process comprising contacting, in the vapor phase, fluorodichloromethane and carbon tetrachloride with an effective amount of a catalyst comprising an activated mixture of iron oxide and rare earth metal oxides at a sufficient temperature and pressure and for an adequate time to produce a reaction product containing fluorotrichloromethane, difluorodichloromethane, difluorochloromethane and chloroform.

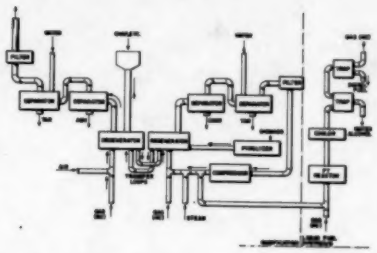
4,678,860

PROCESS OF PRODUCING LIQUID HYDROCARBON FUELS FROM BIOMASS

James L. Kuester, Scottsdale, Ariz., assignor to Arizona Board of Regents, Tempe, Ariz.

Filed Oct. 4, 1985, Ser. No. 784,269
Int. Cl.[4] C10L 1/16
U.S. Cl. 585—14 23 Claims

1. A process for producing liquid hydrocarbon fuels consisting essentially of C_7–C_{17} paraffinic hydrocarbons free of oxygenated compounds from an oxygen-containing biomass comprising: feeding comminuted biomass into a pyrolyzer heated to a temperature of from about 1,200° to 2,000° F. to produce an intermediate synthesis gas containing in mole percent from 10 to 53 percent hydrogen, from about 6 to 60 percent carbon monoxide, from 5 to 39 percent olefins, from 6 to 33 percent paraffins, and from 4 to 26 percent carbon dioxide; thereafter directing said unseparated intermediate synthesis gas into a catalytic reactor operating at about 500° F. 140 psig, and containing a catalyst consisting of an active ingredient selected from the group consisting of cobalt, ruthenium, nickel and iron disposed upn a compatible support structure selected from the group consisting of alumina, silica, kiesulguhr and diatomaceous earths to form a water/alcohol binary and said liquid



hydrocarbon fuel; and separating said liquid hydrocarbon fuel from said water/alcohol binary.

4,678,861

PROCESS FOR PRODUCING A CYCLOOLEFIN

Osamu Mitsui, and Yohei Fukuoka, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 23, 1985, Ser. No. 790,521
Int. Cl.[4] C07C 5/10, 5/11
U.S. Cl. 585—266 29 Claims

1. A process for producing a cycloolefin which comprises partially hydrogenating a monocyclic aromatic hydrocarbon in the presence of water, an alkaline agent and a ruthenium catalyst composed of a solid carrier and a ruthenium component supported thereon, said solid carrier consisting essentially of at least one rare earth element compound, said rare earth element being selected from the group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Sc and Y, said carrier supporting thereon 0.01 to 10 wt. % of said ruthenium component, based on said solid carrier.

4,678,862

MOLTEN SALT HYDROCARBON CONVERSION PROCESS USING OXYGEN CONTAINING FEED

Harry Mazurek, Bala Cynwyd, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 31, 1986, Ser. No. 825,029
Int. Cl.[4] C07C 2/00
U.S. Cl. 585—500 6 Claims

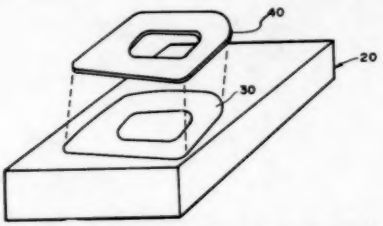
1. A method useful for conversion of methane to higher hydrocarbons which comprises contacting a gas comprising methane and molecular oxygen with a molten salt mixture containing at least one reducible metal oxide at conditions to convert methane to said higher hydrocarbons while maintaining said reducible metal oxide in active form.

4,678,863

CORROSION RESISTANT CONDUCTIVE ELASTOMERS

Robert M. Reese, Philadelphia, Pa., and Norman R. Landry, Mount Laurel, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 27, 1985, Ser. No. 749,271
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 GC 14 Claims



1. A corrosion resistant resilient electrically conductive member comprising:

a body of a conductive elastomer containing metal particles which contain silver; and

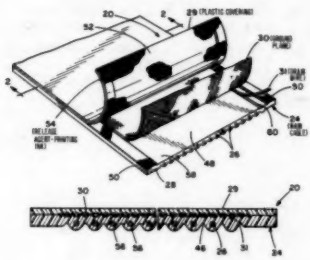
a protective conductive coating on any of said silver-containing metal particles which are exposed at the surface of said body.

4,678,864

MASS TERMINABLE FLAT CABLE ASSEMBLY WITH READILY SEPARABLE GROUND PLANE

Albert R. Cox, Centerville, Ind., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 27, 1985, Ser. No. 750,523
Int. Cl.[4] H01B *7/08, 7/34*
U.S. Cl. 174—36 10 Claims



1. A flat cable assembly for use with a mass termination connector having a plurality of regularly spaced terminal elements, said flat cable assembly comprising:

a main cable including a plurality of conductors held in regularly spaced parallel relationship in a sheet of insulation to match the terminal element spacing of a connector having a plurality of regularly spaced terminal elements, said cable including a first surface, a second surface and lateral edges with said surfaces extending between said lateral edges;

a plastic covering having an interior surface facing said cable second surface, a release agent being printed on at least one of said interior surface and said second surface so that portions of the printed-upon surface are coated by said release agent and other portions of said printed-upon surface are uncoated, said flat cable assembly having lateral edges with the printing of said release agent extending to the lateral edges of said assembly, said printing of said release agent extending the entire width of said assembly so that said covering and said main cable are separated by said release agent the entire width of said assembly permitting manual stripping of said covering without the use of any tools or any cutting; and

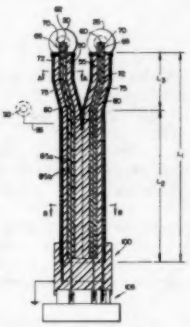
a metallic ground plane disposed between said main cable and said covering, said plastic covering being bonded to said second surface at said uncoated portions.

4,678,865

LOW NOISE ELECTROENCEPHALOGRAPHIC PROBE WIRING SYSTEM

Gary W. Sherwin, South Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,060
Int. Cl.[4] H01B *11/18*
U.S. Cl. 174—36 2 Claims



1. A low noise electroencephalographic (EEG) probe wiring system for connection between an amplifier and at least a pair of EEG probes, comprising:

a pair of coaxial cables each having a length and including:

a central conductor having one end for connection to one pair of EEG probes and a second end for connection to an amplifier;

a graphite coated polyethylene layer positioned around and bonded to the central conductor;

a first conductive braid shield positioned about the graphite coated layer along said length, having a first end and a second end;

a PTFE jacket positioned around said first conductive braid shield along said length; and

said coaxial cables being positioned in contact with each other along a substantially parallel path and along a first portion of said length of said coaxial cables;

a second conductive braid shield having a first briad portion positioned around said pair of coaxial cables and along said first portion of said length, and a second braid portion positioned around respective ones of said coaxial cables along the remaining portion of said length of said cables, said second conductive braid shield having a first end connected to said first end of said first conductive braid shield, a second end and a junction between said first and second braid portions of said second conductive braid shield;

heat shrink tubing positioned around said second conductive braid shield;

a reference lead, connected to said second conductive braid shield at said junction, for connection to an additional reference EEG probe; and

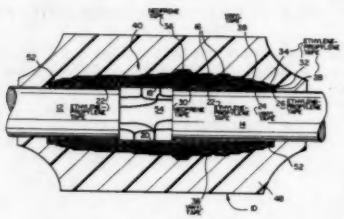
gold contact metal jacket means for connecting the second end of each of said coaxial cables and the second end of said second conductive braid shield to the amplifier, a portion of the jacket means being connected to a ground potential.

4,678,866

FORMING OF CABLE SPLICE CLOSURES

Leonard J. Charlebois, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 8, 1985, Ser. No. 752,747
Int. Cl.[4] H02G *15/08*
U.S. Cl. 174—88 R **7 Claims**



1. A method of forming an encapsulated splice region joining two cable ends comprising:

locating two cable end portions close together and substantially in axial alignment;

electrically connecting conductors of one cable with those of the other to form splices and sealing each individual splice within dielectric sealing material to electrically isolate it from other splices;

covering the splices by surrounding the cable end portions at each axial side of the splices with a barrier layer which extends also over the splices and between the cable end portions to enclose a region between the cable end portions; and

forming a plastic molded encapsulation extending around the cables and over the splices so as to enclose the barrier layer with the barrier layer preventing the encapsulation material from penetrating into the region between cable end portions and into regions of the splices, and the materials of the encapsulation and of the barrier layer being separate and distinct from one another at any interfacial regions of the materials.

7. An assembly of two telecommunications cables disposed with conductors of each cable electrically connected together to form splices with the splices sealed within dielectric sealing material so as to be electrically isolated from one another, a barrier layer extending over the splices, surrounding adjacent end portions of both cables axially at each side of the splices extending between the adjacent cable end portions to enclose a region between the end portions, and a molded plastic encapsulation extending over the cable end portions and enclosing the barrier layer, the encapsulation and barrier layer being separate and distinct from one another at any interfacial regions of the materials and said region between the cable end portions being free of encapsulation material.

4,678,867

ELECTRICAL DEVICE WITH PROTECTIVE SHROUD FOR FLEXIBLE ELECTRICAL CABLE EXTENDING THEREFROM

James A. Bongard; Michael J. Delaney, both of Milwaukee; Eugene F. Duncan, Wauwatosa; Cheryl A. Fredricks, Milwaukee; John P. Groves, Milwaukee; Daniel J. Kalista, Milwaukee; Paul Klingseisen, Milwaukee; Joseph Lazzaro, Milwaukee, and Gregory L. Nadolski, Brookfield, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

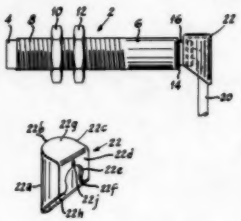
Filed Aug. 1, 1986, Ser. No. 892,007
Int. Cl.[4] H01R *13/56*
U.S. Cl. 174—135 **5 Claims**

1. An electrical device with protective shroud for flexible electrical cables comprising, in combination:

an electrical device mounted on a support structure, said electrical device having a cylindrical projection extending therefrom and a flexible electrical cable extending axially from said cylindrical projection;

an annular groove in said cylindrical projection;

a shroud comprising a first wall having first, second and third contiguous sides and a second wall extending between said first and third sides;



a snap-in slot complementary to said annular groove and having a constricted opening formed in said second wall;

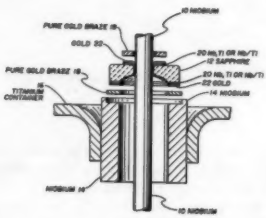
said shroud being attached to said cylindrical projection by pressing said constricted slot into said groove, said first wall enveloping said cable adjacent said projection on at least three sides which are directed away from said support structure.

4,678,868

HERMETIC ELECTRICAL FEEDTHROUGH ASSEMBLY

Robert E. Kraska, Minneapolis; Frank J. Wilary, Plymouth, and Joseph F. Lessar, Coon Rapids, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 51,987, Jun. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 7,153, Jan. 29, 1979, abandoned. This application Jul. 30, 1984, Ser. No. 635,576
Int. Cl.[4] H01B *17/30*; C03C *27/04*
U.S. Cl. 174—152 GM **5 Claims**



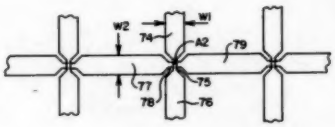
1. An electrical feedthrough comprising an electrical lead-wire consisting essentially of niobium; an alumina insulator around a portion of the lead-wire; a ferrule consisting essentially of niobium positioned around at least a portion of the alumina insulator for receiving same, and brazes joining the lead-wire to the insulator and the insulator to the ferrule, the brazes consisting essentially of substantially pure gold, the alumina insulator being first metallized with a metal selected from the group consisting of niobium, titanium and niobium/-titanium at the brazed areas and wherein the metallizations have a thickness of from about 2,000 to about 40,000 angstroms when they are niobium, from about 5,000 to about 40,000 angstroms when they are titanium and from about 2,000 to about 40,000 angstroms when they are niobium/titanium.

4,678,869

POSITION RESPONSIVE APPARATUS, SYSTEM AND METHOD HAVING ELECTROGRAPHIC APPLICATION

Robert G. Kable, Dublin, Ohio, assignor to Scriptel Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 791,324, Oct. 25, 1985, abandoned. This application May 27, 1986, Ser. No. 865,661
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—19 31 Claims



11. Position responsive apparatus, comprising:

an insulative support;

an x-coordinate array of elongate, transparent grid elements extending between first and second borders and located in mutually spaced parallel relationship from first to last upon said support means;

a y-coordinate array of elongate, transparent grid elements extending between third and fourth borders spaced from said x-coordinate array of grid elements and located in mutually spaced parallel relationship from first to last upon said support means;

first x-coordinate resistor means coupled at said first border with adjacently disposed grid elements of said x-coordinate array for providing discrete resistance therebetween;

second x-coordinate resistor means coupled at said second border with adjacently disposed grid elements of said x-coordinte grid array for providing discrete resistances therebetween;

x-coordinate terminal means coupled with said first and second x-coordinate resistor means adjacent said first and last grid elements for conveying excitation signals thereto;

first y-coordinate resistor means coupled at said third border with adjacently disposed grid elements of said y-coordinate array for providing discrete resistances therebetween;

second y-coordinate resistor means coupled at said fourth border with adjacently disposed grid elements of said y-coordinate grid array for providing discrete resistances therebetween;

y-coordinate terminal means coupled with said first and second y-coordinate resistor means adjacent said first and last grid elements for conveying said excitation signals thereto;

a time varying excitation source of select frequency;

switching means controllable for selectively applying an excitation signal corresponding to said source to said x-coordinate terminal means during a first operational mode and for selectively applying said excitation signal to said y-coordinate terminal means during a second operational mode;

locator means movable in adjacency about said support for select interaction with said x-coordinate and y-coordinate arrays of said grid elements during said first and second modes to effect the derivation of position signals;

detector circuit means responsive to said position signals for deriving digital position signals; and

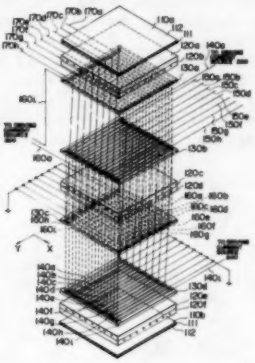
control means for controlling said switching means and treating said digital position signals to derive coordinate pair output signals with respect thereto.

4,678,870

POSITION DETECTING DEVICE

Yoshinori Taguchi, and Tsuguya Yamanami, both of Kuki, Japan, assignors to Wacom Co., Ltd., Saitama, Japan

Filed Dec. 11, 1985, Ser. No. 807,715
Claims priority, application Japan, Dec. 13, 1984, 59-263496; Dec. 27, 1984, 59-274020
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—19 9 Claims



1. A position detecting device comprising:

a tablet portion including a magnetic member composite having a pair of insulating substrates with a plurality of long magnetic members sandwiched therebetween, said magnetic members being substantially parallel to each other; and two conductive member composites, each having a plurality of conductive members substantially parallel to each other, each of said two conductive member composites being placed on opposite side of said magnetic composite in such a manner that said conductive members are disposed orthogonally with respect to said magnetic members; and said conductive members on one of said two conductive member composites connected with the corresponding ones, on another of said conductive member composites, alternately constitute exciting lines and detecting lines;

a driving current source for applying an alternating current of a predetermined frequency to each of said exciting lines;

a position designating magnetic generator for generating a stationary magnetic field passing through the tablet portion; and

a position detecting circuit for detecting, by calculation, the position which is indicated by said position designating magnetic generator.

4,678,871

REVERSING SWITCH FOR RECHARGEABLE HAND TOOL

Jun G. Wong, Villa Park, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed Jul. 22, 1985, Ser. No. 757,334
Int. Cl.[4] H01H 19/10, 21/18
U.S. Cl. 200—1 V 21 Claims

1. A rechargeable hand tool having a housing with access ports, a rechargeable battery, an electric motor having parallel motor leads and a reversing switch between the motor and the battery, the switch comprising:

a stationary mounting support located in the housing;

a switch actuator pivotally mounted to the stationary mounting support;

an upper transfer terminal forming an integrally formed

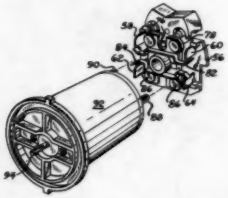
structure comprising a first upper forward post, a second upper forward post, and a first recharging post, the upper transfer terminal being connectable to a second battery terminal;

a lower transfer terminal forming a second integrally formed structure comprising a first lower forward post, a second lower forward post, and a second recharging post, the lower transfer terminal being connectable to a first battery terminal opposite the second battery terminal;

a contact carrier rotatably mounted on the stationary mounting support so that pivoting the switch actuator rotates the contact carrier;

upper and lower pivot contacts attached to the contact carrier, the pivot contacts being electrically insulated from one another;

wherein the pivot contacts are oriented to define a space in which the motor leads are situated so the upper pivot



contact connects one upper forward post with a first motor lead and the lower pivot contact connects one lower forward post with a second motor lead when the actuator is in a first position, and when the actuator is in a second position the upper pivot contact connects one of the upper forward posts with the second motor lead and the lower pivot contact connects one of the lower forward posts with the first motor lead; and

wherein the first and second recharging posts are disposed near the access ports and application of an electromotive force between the recharging posts would supply a charge to the battery;

whereby a battery in contact with the transfer terminals would drive the motor in one direction when the actuator is in a first position and drive the motor in an opposite direction when the actuator is in a second position and whereby the battery can be recharged by easy access to the recharging posts and without removing the battery.

4,678,872

BUTTON SET AND SWITCH

Robert F. Gutman, Detroit, Mich., assignor to United Techologies Automotive, Inc., Dearborn, Mich.

Filed Sep. 10, 1986, Ser. No. 905,604

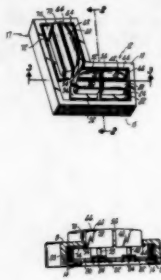
Int. Cl.[4] H01H *9/00*

U.S. Cl. 200—5 R **13 Claims**

1. A switch comprising:

a one-piece molded button set having a series of buttons each connected by a hinge means integral to a frame means extending about the perimeter of the button set such that each button extends inwardly from the frame means and each button may be displaced independently, said buttons being arranged in a pattern to emulate a seat back and a seat bench of an automobile power seat and each button including an actuator portion; and

a circuit means mounted to the button set and including a series of switch means positioned to be engaged by the actuator portion of each button for providing a signal indicating that a button was displaced and that the opera-



tor desires the seat back or seat bench to be displaced in accordance with the particular button displaced.

4,678,873

LOW-VOLTAGE CIRCUIT BREAKER HAVING A SWITCHING MECHANISM ARRANGED IN A SEPARATE CHAMBER

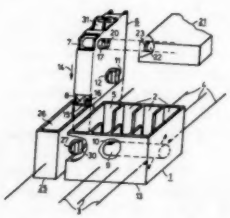
Bernhard Preuss, and Klaus-Gunther Berndt, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 14, 1986, Ser. No. 818,883

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501480

Int. Cl.[4] H01H *71/16*

U.S. Cl. 200—18 **8 Claims**



1. A low-voltage circuit breaker comprising:

housing means of insulating material having a plurality of parallel disposed chambers, contact means for electrical current being provided in all but one of said chambers, switching mechanism means for operating the contact means being arranged in the remaining chamber, a control shaft coupling the switching mechanism means and each of the contact means, said control shaft means being provided for operating the contact means;

carrier means supporting said switching mechanism means, said carrier means comprising a one-piece U-shaped part having cutouts for fastening means provided in a central part thereof;

said control shaft comprising a pole control shaft coupled to the contact means and a drive shaft extending from one side of the switching mechanism means;

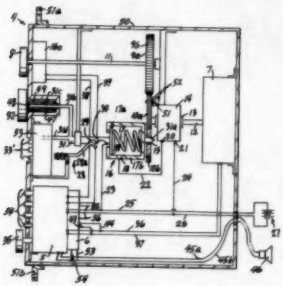
the pole control shaft and said drive shaft of the switching mechanism means having adjacent ends thereof facing each other provided with coupling parts cooperating in a form-locking manner.

4,678,874

ANTI-BURGLARY DEVICE FOR AUTOMOBILE RADIOS AND CASSETTES

Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559

Filed Apr. 3, 1986, Ser. No. 847,960
Int. Cl.[4] H01H 9/28
U.S. Cl. 200—43.12 14 Claims



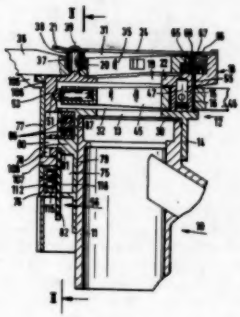
1. An anti-burglary device comprising in combination: a dashboard-mountable audio electronic means for an electronic audio function including reproducing cassette or radio audio sound, said audio electronic means including audio elements adapted to reproduce audio sound; a lever means for intermittent alternate switching from an inoperative position for said electronic function to an alternate operative position required to achieve said electronic function, said lever means including an interior inaccessible portion connected to an accessible exterior manual manipulation portion arranged to make possible manual movement of the interior inaccessible portion; a dial-type combination lock means for securing and unsecuring said lever means at said inoperative position at which said electronic function cannot be achieved, said dial-type lock means having locking elements having dials adapted for dialing said locking means to and from alternate unlocked and locked positions, said dial-type lock means being additionally for manual movement alternately from and to release and securing of the lever means in said inoperative position when said dials have been dialed to said unlocked position; and durable protective enclosure means for structurally substantially enclosing protectively each of said electronic means and said dial-type lock means and said interior inaccessible portion of said lever means such that the enclosed said electronic means and the enclosed said dial-type lock means and the enclosed said interior inaccessible portion are inaccessible and protectively shielded from access and from by-passing of the dial-type lock means from an exterior space and such that said dials and said manipulation portion are each accessible from an exterior of said enclosure means, and such that when the anti-burglary device is in locked positions, it being impossible to utilize operatively the lever means and the audio electronic means in absence of physically destroying the audio electronic means in an effort to gain access thereto through its enclosure means; and mounting means for mounting the electronic means within said enclosure means and for mounting the enclosure means within or on an automobile dashboard.

4,678,875

STEERING COLUMN SWITCH FOR MOTOR VEHICLES

Herbert Erdelitsch, and Walter Hecht, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to WSWF Auto-Electric GmbH, Bissingen, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,648
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440763
Int. Cl.[4] H01H 9/00, 25/04
U.S. Cl. 200—61.54 29 Claims



1. A steering column switch comprising:

a housing having a central aperture;

first and second switching members independently supported in said housing one above the other, said first switching member being swivellable about a first axis, said second switching member being swivellable about a second axis, and first and second axes defining a swivelling plane, said first and second axes being parallel and substantially diametrically opposite each other relative to said aperture, said first and second switching members each being independently tiltable perpendicularly to said swivel plane;

first switch means comprising a first switch plate including an insulating plate supported in said housing and having conductors thereon, one end of said first switch plate forming an electrical plug part; first contact means movable by said first switching member on said first switch plate to a plurality of first switching positions;

second switch means comprising a second switch plate including a second insulating plate supported in said housing and having conductors thereon, one end of said second switch plate forming a second electrical plug part; second contact means movable by said second switching member on said second switch plate to a plurality of second switching positions;

said switch operating such that tilting said first switching member causes said first switch means to change from one switching position to a second switching position; swivelling of said first switching member causes said first switch means to change from one switching position to another switching position; tilting said second switching member causes said second switch means to change from one switching position to a second switching position; and swivelling of said second switching member causes said second switch means to change from one switching position to another switching position.

4,678,876

ISOLATING SWITCH APPARATUS FOR A HIGH-VOLTAGE SWITCHING SYSTEM WHICH MAY BE INSULATED WITH SF_6 GAS

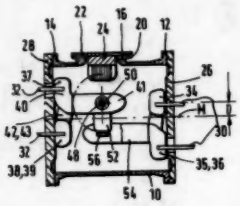
Paul Westbrock, Gelnhausen-Meerholz, and Theo Peitz, Hanau, both of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Jun. 11, 1984, Ser. No. 619,070

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321146

Int. Cl.[4] H01H *33/60*

U.S. Cl. 200—148 R **14 Claims**



1. Isolating switch apparatus, comprising an encapsulation having first and second opposite sides, at least one disconnection point and a plurality of contact points corresponding to a given number of phases therein, a plurality of phase conductors at least partially disposed in said encapsulation for a plurality of phases, first and second connection pieces connected to said phase conductors in said encapsulation for each contact point of each phase, said first connection piece projecting from said first side to a given point in said encapsulation, said second connection piece projecting from said second side to a point beyond said given point causing said first and second connection pieces to be partially overlapped, mutually spaced apart and substantially mutually parallel, a contact piece disposed on said second connection piece, an insulated drive shaft passing through a hole formed through said first connection piece, said second connection piece extending beyond said drive shaft, and a contact blade attached to and rotatable by said drive shaft into a switched-on position in which said contact blade is substantially perpendicular to said first and second connection pieces, is disposed between said first and second connection pieces, and contacts said contact piece.

4,678,877

OPERATING MECHANISM FOR A CIRCUIT-BREAKER, AND A CIRCUIT-BREAKER FITTED WITH THE MECHANISM

Dante Nicoloso, Jonage, France, assignor to Alsthom, Paris, France

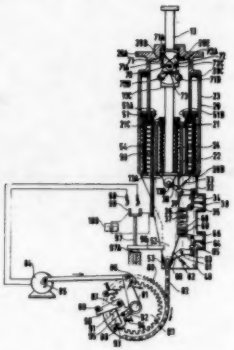
Filed Oct. 23, 1986, Ser. No. 922,225

Claims priority, application France, Oct. 23, 1985, 85 15751

Int. Cl.[4] H01H *33/42*

U.S. Cl. 200—148 F **5 Claims**

1. A mechanism for operating a circuit-breaker and suitable for causing a circuit-breaker to perform a rapid opening-closing-re-opening cycle, said circuit-breaker including a set of fixed contacts and a set moving contacts, said operating mechanism including an operating rod for connection to said set of moving contacts, a first spring imparting motion, when it expands, to said rod in a direction corresponding to circuit-breaker opening, a second spring capable of storing at least twice as much energy as said first spring and imparting motion, when it expands, to said rod in a direction which corresponds to said circuit-breaker closing said mechanism further including means for ensuring that expansion of said second spring causes said first spring to be re-compressed, and each of said first and second springs being associated with a respective controllable locking member, said circuit-breaker operating mechanism including the improvement whereby it further includes a first cylinder having said operating rod passing axially therethrough, a second cylinder coaxial with said first cylinder, fixed relative thereto, and containing said first spring therein, and a third cylinder coaxial with said first and second cylinders and disposed between said first cylinder and said second cylinder and being movable relative thereto, said second spring being disposed between said first and second cylinders said third cylinder including a collar serving as an abutment for said second spring, and enabling said third cylinder to slide in said first cylinder and co-operating with a set of levers which are hinged on and fixed to said rod for driving said rod when said second spring expands.



4,678,878

GAS PRESSURE CIRCUIT BREAKER

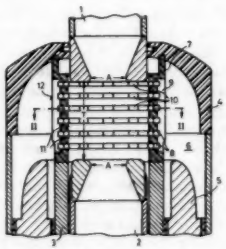
Helmut Beier, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,632

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 3538955

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **9 Claims**



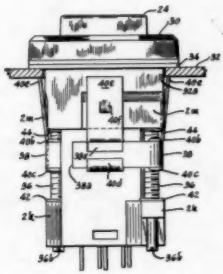
1. A gas pressure circuit breaker comprising a break gap formed by two fixed contacts and having an insulation tube surrounding the gap at least at times and having sheath-side openings for the distribution of a quenching gas flowing into the break gap, the insulation tube being internally and externally grooved, the inner and outer grooves forming crossings and have a depth such that they penetrate each other at the crossings, thereby forming the openings.

4,678,879

PANEL MOUNTED APPARATUS WITH FRONT OPERATED CLAMPING MEANS

Sidney Kenway, Fountain Valley, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 10, 1986, Ser. No. 827,997
Int. Cl.[4] H01H 13/04
U.S. Cl. 200—295 5 Claims



1. Apparatus adapted to be front mounted to a panel through a hole in said panel comprising, in combination:

a rectangular housing comprising a forward end having a transverse profile larger than said hole in said panel, an intermediate portion having a tranverse profile substantially corresponding to said hole in said panel, and a rear portion having a reduced transverse profile relative to said intermediate portion, said housing being open to said forward end;

a pair of screws rotatably supported within said intermediate portion of said housing at diagonally opposed locations and extending rearwardly along diagonally opposed corners of said rear portion exteriorly thereof, said screws having tool engagable drive means accessible through said open forward end of said housing;

a pair of nuts each comprising a pair of arms joined together at a right angle at an apex and having a threaded opening for receiving a respective one of said screws in said apex, said arms engaging exterior surfaces of respective adjacent sides of said rear portion of said housing for preventing rotation of said nuts, and said nuts being movable forwardly and rearwardly along said exterior surfaces of said rear portion of said housing in response to rotation of said screws;

a plurality of clamping straps, respective ones of said straps being affixed to a respective arm of said nuts at a midpoint of a respective side of said housing and extending forwardly along said exterior surface of said rear portion of said housing and within respective recesses in exterior side surfaces of said intermediate portion of said housing; and

cam means on each said clamping strap cooperable with said intermediate portion of said housing upon forward movement of said nuts for deflecting said clamping straps outwardly of said intermediate portion of said housing;

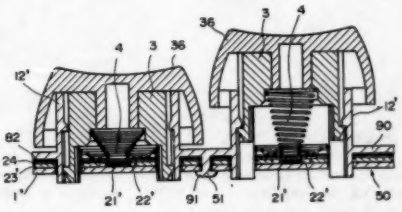
said apparatus being insertable through said hole in said panel wherein said forward end abuts a front face of said panel adjacent said hole, said intermediate portion is located in said hole, and forward ends of said clamping straps are deflected outwardly of said intermediate portion of said housing and drawn into engagement with a rear surface of said panel at a midpoint of each of four respective sides of said rectangular housing upon appropriate rotation of said screws for clamping said device to said panel.

4,678,880

KEYBOARD SWITCH

Haruyuki Koizumi, and Koichi Omae, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 17, 1985, Ser. No. 724,308
Claims priority, application Japan, Apr. 18, 1984, 59-79119; Apr. 18, 1984, 59-79120; Nov. 1, 1984, 59-231992
Int. Cl.[4] H01H 3/12
U.S. Cl. 200—340 6 Claims



1. A keyboard switch comprising:

a substrate having on an upper surface thereof a flexible switch which has a pair of spaced engageable contacts, at least one of said contacts being fixed to a flexible sheet,

at least two guide posts passing through respective apertures in said substrate and being secured to said substrate at mutually opposed positions on either side of said contacts,

a key plunger having spaced extending leg portions respectively fitted vertically movably in said guide posts, said key plunger being capable of reciprocal up and down movement with said leg portions being guided by said guide posts and moving through said substrate during said reciprocal movement, and

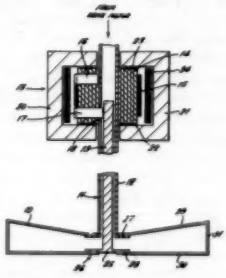
a coil spring interposed between said key plunger and said substrate, said coil spring pushing said flexible switch, when compressed by a depression of said plunger, to cause said paired contacts to come into contact with each other and, when uncompressed, returning said key plunger to an initial position to separate said paired contacts.

4,678,881

INDUCTION APPARATUS FOR HEATING AND MIXING A FLUID

John T. Griffith, Mold, United Kingdom, assignor to The Electricity Council, London, England

Filed May 28, 1986, Ser. No. 867,994
Claims priority, application United Kingdom, May 28, 1985, 8513505
Int. Cl.[4] H05B 6/10
U.S. Cl. 219—10.51 7 Claims



1. Apparatus for heating and mixing a fluid, comprising a vessel for fluid to be heated and mixed, a mixing paddle in the

vessel and rotatable on a shaft to mix the fluid, a magnetic rotor core mounted on the shaft to rotate with the shaft, an electric conductor circuit formed of a rotor winding on the rotor core in series with a heating conductor in the paddle, and induction means to generate, at least on rotation of the shaft, a varying magnetic flux in the rotor core to induce a heating current in said rotor winding and the heating conductor in the paddle.

4,678,882

PACKAGING CONTAINER FOR MICROWAVE POPCORN POPPING

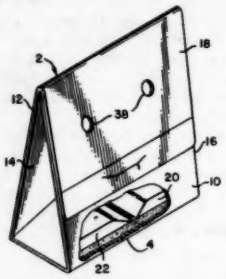
Timothy H. Bohrer; Thomas D. Pawlowski, both of Neenah, and Richard K. Brown, Appleton, all of Wis., assignors to James River-Norwalk, Norwalk, Conn.

Continuation of Ser. No. 735,576, May 20, 1985, abandoned, which is a division of Ser. No. 510,735, Jul. 5, 1983, Pat. No. 4,553,010. This application Jan. 3, 1986, Ser. No. 815,318

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] H05B *6/80*

U.S. Cl. 219—10.55 E **11 Claims**



1. A package for shipping and microwave popping of popcorn, comprising:

(a) a predetermined quantity of popcorn kernels which will occupy a predictable volume when popped;

(b) a package containing said predetermined quantity of popcorn and, when used for popping corn, having a predetermined internal volume at least equal to said predictable volume occupied by said popcorn kernels when popped, said package having a wall adapted to rest in a generally flat horizontal configuration upon a horizontal support surface in a microwave oven, said wall having an interior surface that is large enough for said predetermined quantity of unpopped popcorn to be spread thereon in a generally unclumped manner; and

(c) a microwave converting means integrally connected with said package for converting microwave energy into heat for transfer in a sufficient amount to the popcorn kernels when unclumped to reduce substantially the number of burned or unpopped kernels that could result if the kernels were popped solely by direct impingement of microwave energy, said microwave converting means including a microwave interactive material whose temperature increases in response to impinging microwaves, said microwave interactive material being connected with said wall and co-extensive with an area of said interior surface which is sufficiently large to permit said predetermined quantity of popcorn to be spread thereon in said unclumped manner.

4,678,883

ELECTROMAGNETIC-INDUCTION HEATER WITH MAGNETIC FIELD CONTROL

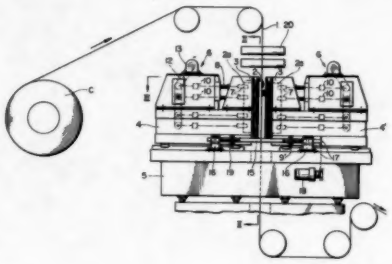
Hajime Saitoh, and Morio Maeda, both of Niihama, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jun. 10, 1986, Ser. No. 872,573

Claims priority, application Japan, Aug. 9, 1985, 60-174256

Int. Cl.[4] H05B *6/40*

U.S. Cl. 219—10.61 R **4 Claims**



1. An electromagnetic-induction heater comprising:

a strip which is transferred in a predetermined direction;

electromagnets disposed on both sides of said strip in a face-to-face relationship to heat said strip by electromagnetic induction, said electromagnets including

a plurality of magnetic-pole segments disposed transverse to the direction of travel of said strip, said plurality of magnetic-pole segments being individually movable toward and away from said strip,

a plurality of common coils, each common coil surrounding a group of said magnetic-pole segments;

non-magnetic movable shield plate to reduce a fringing field generated by each of said magnetic-pole segments, said shield plate being disposed adjacent to at least one end portion of each electromagnet near said strip, said shield plate being movable forward and backward parallel to and transversely to the length of said strip; and

means for moving said non-magnetic movable shield plate, said means for moving said shield plate including

at least two rods connected near an edge of said shield plate,

connected rods for interconnecting said at least two rods,

screw means for interconnecting said connecting rods, and

screw driving means for driving said screw means so said at least two rods are moved through said connecting rod to change the displacement of said shield plate.

4,678,884

WIRE DISCHARGE MACHINING POWER SOURCE

Haruki Obara, Sagamihara; Masaya Ito, and Masashi Tonamura, both of Hino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Nov. 22, 1985, Ser. No. 807,509

Claims priority, application Japan, Mar. 26, 1984, 59-56135

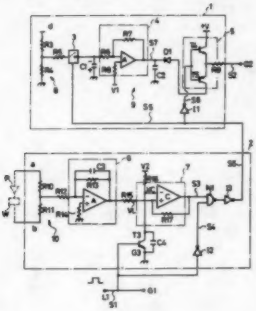
Int. Cl.[4] B23H *1/02*

U.S. Cl. 219—69 P **13 Claims**

1. A wire discharge machining power source for turning on a switching element to apply a voltage from a first power supply between a wire electrode and a workpiece during machining so as to cause an electric discharge, and for applying a reverse voltage, having a polarity opposite to that of the voltage applied during machining, when the switching element is turned off, the reverse voltage being applied from a second power supply between the wire electrode and the workpiece through a series circuit consisting of a transistor and a resistor and connected in series with the second power supply, comprising:

a reverse voltage application time control circuit, coupled to the wire electrode and the workpiece, for detecting a value of an average machining voltage applied between the wire electrode and the workpiece, and for generating a pulse with a pulse width corresponding to the average machining voltage value; and

a reverse voltage regulating circuit, coupled to the transistor and said reverse voltage application time control circuit, and having a sample/hold circuit for detecting and holding a difference between a reference voltage and a voltage



across the series circuit upon application of the reverse voltage, the voltage across the series circuit being increased and decreased upon a decrease and an increase, respectively, in the voltage applied between the wire electrode and the workpiece, said reverse voltage regulating circuit for generating an output with a value corresponding to a holding voltage of said sample/hold circuit, the output from said reverse voltage regulating circuit being generated for a period corresponding to the pulse width of the pulse from said reverse voltage application time control circuit.

4,678,885

POWER SUPPLY CIRCUIT FOR SPARK EROSION

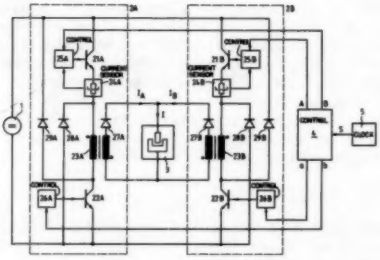
Silvano Dresti, Cannobio, Italy; Ernst Buhler, and Rene Derighetti, both of Losone, Switzerland, assignors to AG fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed May 10, 1985, Ser. No. 733,006

Claims priority, application Switzerland, May 11, 1984, 2353/84

Int. Cl.[4] B23H *1/02*; G05F *1/44*

U.S. Cl. 219—69 C **6 Claims**



1. A spark generator for the machining of an electrically conductive workpiece in a spark erosion plant across a spark gap formed between the workpiece and a tool electrode with substantially no ballast resistance, comprising a direct current power supply; at least one switching circuit connected in parallel with the power supply; and a control device connected to each switching circuit; each switching circuit comprising first and second switching elements, each switching element having a conductive and a nonconductive state; a pulse transformer having a primary and secondary winding, the switching elements and the primary winding being connected in series circuit so that current from the power supply is applied to the primary winding when the switching elements are placed in the conductive state, and the secondary winding being connected in parallel with the spark gap; and a unidirectional current conducting means associated with each switching element and operatively connected across the primary winding and the associated switching element to place the pulse transformer in a freewheeling state when only the associated switching element of the first and second switching elements is in the conductive state; the control device being operatively connected to each switching element and adapted to selectively place each switching element in the conductive state in accordance with a predetermined pattern.

4,678,886

AUTOMATIC SOLDERING DEVICE

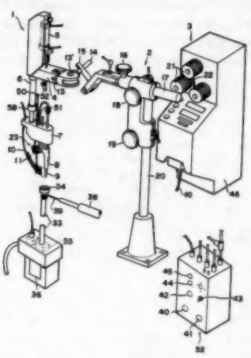
Seiji Kawaguchi, 22-203, Nishiminecho 21, Ota-ku, Tokyo, 146, Japan

PCT No. PCT/JP85/00083, § 371 Date Nov. 13, 1985, § 102(e) Date Nov. 13, 1985, PCT Pub. No. WO85/03866, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 25, 1985, Ser. No. 810,338

Int. Cl.[4] B23K *1/02, 1/04*

U.S. Cl. 219—85 R **8 Claims**

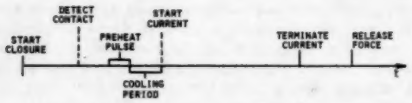


1. In an automatic soldering system wherein soldering is conducted by lowering a soldering iron having a tip toward a work surface by means of an air cylinder, supplying thread solder in a predetermined amount from a solder feeder installed separately via a feeding tube at a timing coincided with the lowering of the iron, controlling both the preheating and heating times of the iron and dividing the supply of thread solder in two stages, an automatic soldering device characterized by the fact that an end portion of said feeding tube for guiding the thread solder is supported near and directed toward the iron tip by means of a holder including a holder plate and said holder plate is supported by a base plate by means of a spring, and the holder can be freely adjusted with respect to its position and angularity horizontally, vertically and obliquely relative to the iron tip in all directions by adjusting the protrusion of plural screws provided on the base plate to modify the force exerted by said spring upon said holder plate.

4,678,887
METHOD AND APPARATUS FOR RESISTANCE WELDING

Gregory L. Nagel, Royal Oak; Anthony Lee, West Bloomfield, and Warren D. Hill, Lake Orion, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 9, 1986, Ser. No. 883,781
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—117.1 14 Claims



1. A method of resistance spot welding comprising the steps of:

moving weld electrodes into contact with a workpiece and applying electrode force to the workpiece,

determining a preheat pulse time in the period following contact of weld electrodes with the workpiece and prior to attaining full electrode force,

applying a preheat current pulse at the preheat pulse time and extending for a time sufficient to vaporize coatings and melt the workpiece surfaces at the interfaces,

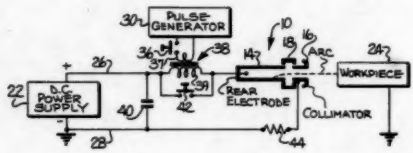
inhibiting further weld current for a cooling period after the preheat pulse to allow heat dissipation from the hot interfaces, and then

applying a predetermined weld current schedule.

4,678,888
POWER CIRCUIT APPARATUS FOR STARTING AND OPERATING PLASMA ARC

Salvador L. Camacho, and David P. Camacho, both of Raleigh, N.C., assignors to Plasma Energy Corporation, Raleigh, N.C.

Continuation-in-part of Ser. No. 460,062, Jan. 21, 1983, Pat. No. 4,549,065. This application Oct. 21, 1985, Ser. No. 789,398
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 PW 11 Claims



1. An apparatus for starting and maintaining a plasma arc which is characterized by the use of a power supply of relatively low capacity and cost, and comprising

a plasma torch comprising a rear electrode composed of a tubular metal member having a closed inner end and an open outer end, a front tubular metal member having a bore therethrough and mounted in coaxial alignment with and separated from said open outer end of said rear electrode, and gas vortex generating means diposed intermediate said rear electrode and said front tubular member for generating a vortical flow of a gas therebetween,

an electrical power supply,

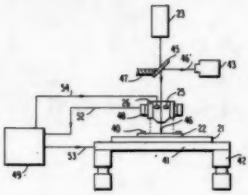
circuit means operatively interconnecting said power supply to said plasma torch and including a first line connecting one terminal of said power supply to said rear electrode, and a second line connecting the other terminal of said power supply to said front tubular member, and

electrical pulse generator means operatively connected to said circuit means in series with said plasma torch for selectively applying direct current pulses of relatively high energy to said circuit means and which is sufficient to initiate an electrial arc between said rear electrode and said front tubular member, said pulse generator means including a secondary transformer coil connected in said circuit means, and bypass switch means for selectively removing said secondary transformer coil from said circuit means.

4,678,889
METHOD OF LASER TRIMMING IN SEMICONDUCTOR WAFER

Hiroshi Yamanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,609
Claims priority, application Japan, Nov. 6, 1984, 59-233805
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LJ 3 Claims



1. A method of laser trimming in a semiconductor wafer by a laser trimming apparatus, said semiconductor wafer having a plurality of semiconductor pellets, each said semiconductor pellet including a first programmable link positioned at a first position thereof and a second programmable link positioned at a second portion apart from said first portion, said laser trimming apparatus having an X-Y stage which is movable horizontally in X and Y directions and a laser beam means provided above said X-Y stage for irradiating a laser beam downward at predetermined periods along a fixed axis which is kept invariable, said method comprising the steps of:

mounting said semiconductor wafer on said X-Y stage,

conducting a first series of trimming operations, said first series of operations including moving said X-Y stage such that said first programmable links of said semiconductor pellets successively intersect said fixed axis, stopping said X-Y stage for a first duration of time whenever such one of the first programmable links that is to be disconnected is positioned under said fixed axis, and irradiating said laser beam along said fixed axis during said first duration of time in order to disconnect the first programmable link, and

conducting a second series of trimming operations after the first programmable links that are to be disconnected are all disconnected by said first series of operations, said second series of operations including moving said X-Y stage such that said second programmable links of said semiconductor pellets successively intersect said fixed axis, stopping said X-Y stage for a second duration of time whenever such one of the second programmable links that is to be disconnected is positioned under said fixed axis, and irradiating said laser beam along said fixed axis during said second duration of time in order to disconnect the second programmable link to be disconnected.

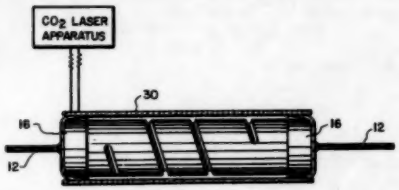
4,678,890
HERMETICALLY SEALED METAL FILM RESISTOR

Billy B. Sorrow, Mineral Wells, Tex., assignor to North American Philips Corporation, New York, N.Y.

Filed May 9, 1986, Ser. No. 861,780
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 L 8 Claims

1. A hermetically sealed, glass encapsulated heat sensitive electrical component having metal end caps at opposed ends thereof, comprising:

a glass sleeve sized to surround said component and having circumferential ends abutting said metal end caps;



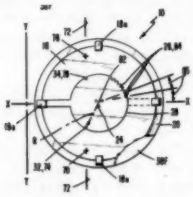
a hermetic seal between the circumferential ends of said glass sleeve and the side edges of said end caps, said seal being made by a focused laser beam.

4,678,891

METHOD FOR ADJUSTING AN ELECTRICAL DEVICE BY ELECTRODE TRIMMING

Robert D. Caruso, Derry, N.H., and Joseph A. Messina, North Andover, Mass., assignors to American Telephone and Telegraph Company, AT&T Technologies, Berkeley Heights, N.J.

Filed Oct. 18, 1984, Ser. No. 661,985
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LJ **10 Claims**



1. A method of adjusting an electrical device to a desired value, wherein the electrical device includes a circular electrode of a known radius formed on a substrate, which method comprises the steps of:

locating the electrical device in a coordinate system;

causing relative movement between the electrical device and an electrode edge-engaging means to cause the electrode edge-engaging means to engage spaced first and second edge portions of the circular electrode associated with first and second coordinate positions, respectively;

detecting the engagement of the spaced first and second electrode edge portions by the electrode edge-engaging means;

measuring the relative distances traveled by the electrical device and the electrode edge-engaging means with respect to the first and second coordinate positions until the electrode edge-engating means engages the spaced first and second electrode edge portions, respectively, to determine the coordinate positions of the electrode edge portions;

utilizing the coordinate positions of the spaced first and second electrode edge portions and the known radius of the circular electrode to determine coordinate positions on the electrode which define at least one arc which extends on the electrode adjacent a peripheral edge of the electrode; and

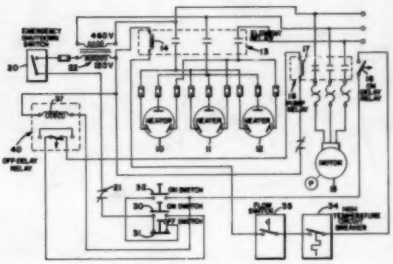
removing material from the circular electrode along the defined arc to change the value of the electrical device.

4,678,892

COMBINATION CLEANER SAFETY CIRCUIT

John F. Finger, and Glen A. Lawrenson, both of Beresford, S. Dak., assignors to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Oct. 7, 1985, Ser. No. 785,341
Int. Cl.[4] H05B *1/02*; F24H *1/08*
U.S. Cl. 219—272 **7 Claims**



1. A steam cleaner, comprising:

a water heating chamber;

electrical heating elements disposed in said heating chamber

an electrical pump for circulating water through said heating chamber;

means for selectively supplying electrical energy to said elements and said pump including:

a pump relay having a coil;

an element relay having a coil;

an on-time delay relay operative to close a predetermined time interval after said pump relay closes;

an off-time delay relay having a coil and being operative to open a predetermined time interval after its coil is de-energized;

a pressure-sensitive circuit breaker located in said cleaner to sense dangerously high pressures;

a first on-switch connected on one side to a source of electrical energy through said pressure-sensitive circuit breaker and on the other side to one side of said off-time delay relay, the other side of said off-time delay relay being connected to the coil of said pump relay;

a second on-switch having two sides;

an off-switch connected on its one side to said one side of said first on-switch and on the other side to one side of said second on-switch, said second on-switch being connected on its other side to one side of said on-time delay relay and to the coil of said off-time delay relay whereby closing said second on-switch energizes said pump and closes said off-time delay relay; and

a flow-switch and a heat-sensitive circuit breaker connected in series between said on-time delay relay and the coil of said element relay, said flow switch being mounted in said cleaner to detect and close in response to the flow of water through said water heating chamber, said heat-sensitive circuit breaker mounted proximate said heating elements and operative in response to temeperatures in excess of a desired threshold to open;

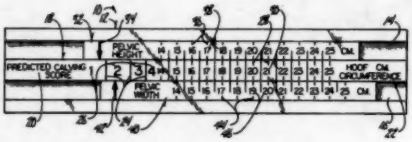
whereby said means for selectively supplying electrical energy to said elements and pump prevents said heating elements from being energized prior to the filling of said heating chamber with water, and whereby said pump is maintained in operation for a predetermined time following the de-energizing of the heating elements as accomplished by operating said off-switch.

4,678,893

METHOD AND MEANS FOR DETERMINING THE EASE WITH WHICH A COW MAY GIVE BIRTH TO A CALF

Marshall V. Ruble, Kelley, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Apr. 22, 1986, Ser. No. 854,536
Int. Cl.[4] G06G *1/02*
U.S. Cl. 235—70 R 4 Claims



1. A device for calculating a predicted calving score for a cow which is about to give birth to a calf; comprising:

a frame means;

a first elongated member on said frame means and having a first end, a second end, a front face, an upper edge and a lower edge, said front face of said first elongated member having a predicted calving score scale at said first end thereof and a hoof circumference scale at said second end thereof;

a second elongated member having first and second opposite ends and a front face, said front face of said second elongated member having an indicator mark adjacent said first end thereof and having a pelvic height scale thereon;

a third elongated member having first and second opposite ends and having a front face, said front face of said third elongated member having an indicator mark adjacent said first end thereof and having a pelvic width scale thereon;

all of said pelvic height scale, said pelvic width scale, and said hoof circumference scale being divided into equal units of length;

said predicted calving score being divided into units of length which are unequal to each other and which are unequal to said units of length of said pelvic height, pelvic width, and hoof circumference scales;

said second elongated member being movably mounted on said frame means adjacent said upper edge of said first elongated member for longitudinal sliding movement with respect thereto to a plurality of positions where selected units of said pelvic height scale are in register with selected units of said hoof circumference scale and said indicator mark of said second elongated member is in register with one of said units of said predicted calving score scale;

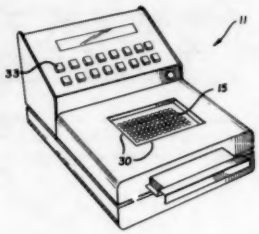
said third elongated member being movably mounted on said frame means adjacent said lower edges of said first elongated member for longitudinal sliding movement with respect thereto to a plurality of positions where selected units of said pelvic width scale are in register with selected units of said hoof circumference scale and said indicator mark of said third elongated member is in register with one of said units of said predicted calving score scale, whereby said predicted calving score may be calculated by extending a line from said indicator mark of said second elongated member across said predicted calving score scale to said indicator mark of said third elongated member, said average predicted calving score being indicated by the one of said units of said predicted calving score scale located at the midpoint of said line.

4,678,894

SAMPLE IDENTIFICATION SYSTEM

John C. Shafer, Milford, Mass., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 18, 1985, Ser. No. 724,389
Int. Cl.[4] G06F *15/20*
U.S. Cl. 235—375 23 Claims



1. Apparatus for use with a plurality of individual materials comprising:

material-identification means for individually identifying each of said plurality of individual materials;

receiving means for receiving said plurality of individual materials, said receiving means including a plurality of individual receiving locations in an array, each receiving location for receiving an individual material; location-identification means for identifying the unique location of each of said receiving locations within said array;

insertion means for inserting an individual material from said plurality of individual materials into one of said individual receiving locations, said insertion means including a means for depositing said individual material into said individual receiving locations;

insertion-detection means for detecting when insertion is occurring in an individual receiving location as identified by said location-identification means; and

recording means for recording deposition of said individual material by said insertion means into said individual receiving locations, said recording means recording the identification of said unique location in which said individual material has been deposited as determined by said location identification means and for recording the individual identity of said material as determined by said material identification means.

4,678,895

SYSTEM FOR MAKING PAYMENTS FOR TRANSACTIONS

Kazuma Tateisi, Ukyo, and Yoshitsugu Shinohara, Shiga, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 27, 1983, Ser. No. 545,912
Claims priority, application Japan, Oct. 29, 1982, 57-191048
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 12 Claims

1. A system for making payments for transactions comprising:

(A) an electronic cash register comprising:

means for entering data relating at least to the prices of goods,

means for calculating the total sum of the prices entered as the sum to be paid, and

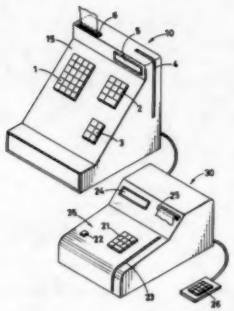
a first card reader for reading data from bank cards each having recorded therein at least data relating to the account number of the holder of the card, data relating to the bank where the account is opened and data for identifying the holder, and

(B) a payment making terminal device connected to the electronic cash register for connection with a control

center provided with a file having stored therein data relating to the accounts of users and stores and with the function of transferring sums payable from the accounts of users to the accounts of stores, the terminal device comprising:

first memory means for storing paired data transferred from the electronic cash register and including the bank card data and sum payable, a second card reader for reading the data recorded in the bank card,

means for searching the first memory means for paired data including the card data which has a predetermined



relationship with respect to the data read by the second card reader,

second memory means having stored therein data relating to the account numbers of a plurality of stores,

means for reading out data from the second memory means relating to the account number of a selected store, and

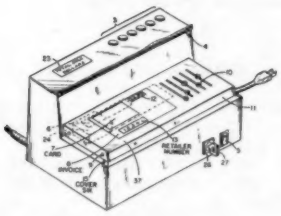
means for transmitting to the control center data relating at least to the account number of the user and the sum payable and data relating to the account number of a selected store read out from the second memory means.

4,678,896

POINT-OF SALE MECHANISM

Steven R. Carlson, and Paul R. Carlson, both of 417 2nd Ave., SE., Beach, N. Dak. 58621

Filed Oct. 6, 1986, Ser. No. 915,505
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **8 Claims**



1. A secured point-of-sale mechanism comprising:

(a) a closable two compartment housing having a secured portion including a plurality of signal devices indicating the condition of a plurality of circuits contained in said secured portion of said housing;

(b) an unsecured door portion cooperating with said secured portion for completing said two compartment housing;

(c) a monetary negotiable instrument section disposed within said secured portion having a first part for retaining a credit card, a second part for retaining an invoice of a point-of-sale transaction, a third part for retaining a check for a point-of-sale transaction, a fourth part for retaining any monetary negotiable instrument, a fifth part for identifying the payee of said transactions, and a sixth part for establishing the transaction selling price;

(d) a transaction price index settable to the correct sales amount purchased by a customer;

(e) a first plurality of switching mechanisms having a first part fixed in said secured portion of said housing and a second part extending into said unsecured portion of said housing to be actuated by said unsecured door portion;

(f) a second plurality of switching mechanisms having a first part fixed in said secured portion of said housing and a second part extending into said unsecured portion of said housing to be actuated by a combination of monetary negotiable instruments;

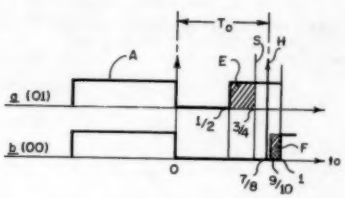
(g) and a locking mechanism connected to said plurality of switching mechanisms and disposed between said secured and unsecured portions of said housing for securing said housing against invasion as long as said plurality of switching mechanisms are actuated.

4,678,897

PROCESSES AND DEVICES FOR READING MAGNETIC ACCESS CONTROL CARDS OR SIMILAR

Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint Cloud, and Claude Hennion, 18, rue Flatters, 75005 Paris, both of France

Filed May 1, 1984, Ser. No. 605,810
Claims priority, application France, May 6, 1983, 83 07626
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—436 **10 Claims**



1. A process for reading coded sequences of magnetic signals recorded on cards or similar carriers, which sequences are formed of bits of identical duration the reading of which results respectively, for some—called 0 hereafter—by a single change of level of an electric voltage or other given parameter and, for the others—called 1 hereafter—by two changes of level of said parameter regularly spaced apart in time, according to which the real duration of each bit read is measured and the time of identification for reading each bit is adjusted depending on the real duration t_o of the "preceding bit", characterized in that to time T which separates the end of reading of this "preceding bit" and said identification time is given:

if the preceding bit is a 1, a value T_1 between 0.6 t_o and 0.75 t_o,

and if said preceding bit is a 0, a value T_o between 0.75 t_o and 15/16 t_o.

4,678,898

IDENTIFICATION CARD WITH IMPROVED CONCEALED CODING AND AN OPTICAL SWIPE READER HOUSING FOR USE WITH IT

Peter E. Rudland, Broadstone, England, assignor to Time and Data Systems International Limited, Poole, England

Filed Oct. 4, 1984, Ser. No. 657,670

Claims priority, application United Kingdom, Oct. 7, 1983, 8326874

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.[4] G06K 7/10

U.S. Cl. 235—468 11 Claims

1. A housing for the optoelectronic components required to read a concealed code of a card or badge arranged along a line parallel to one edge of the card, said housing being formed with two internal chambers that accommodate an infra-red light emitting diode and a photosensor respectively, the two chambers being provided with holes disposed on opposite sides of an external slot to facilitate a beam of infra-red radiation passing through the holes and across the slot to read the code embodied in the aforesaid card or badge as the edge of the card is advanced through the slot and at the surface at the bottom of the slot sloping upwards from the periphery of the housing to a point of maximum height mid-way through the slot that is immediately below the point at which the infra-red beam passes across the slot so that the beam reads the code even when the edge of the card is slightly misaligned.

4,678,899

AFOCAL VARIABLE MAGNIFICATION OPTICAL SYSTEM

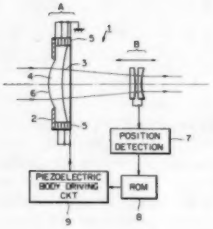
Takeshi Baba, Yokohama, and Shigeyuki Suda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,577

Claims priority, application Japan, Sep. 28, 1984, 59-203612

Int. Cl.[4] G01J 1/20; G02B 3/00

U.S. Cl. 230—201 13 Claims



1. An afocal variable magnification optical system comprising:

a first optical system having at least one variable refracting power element which is capable of continuously changing its refracting power;

a second optical system, the optical axes of said first and second optical systems being common and said second optical system being spaced from said first optical system along the common optical axis; and

said space between said first and second optical systems along the common optical axis being variable.

4,678,900

ILLUMINATING OPTICAL SYSTEM FOR ENDOSCOPES

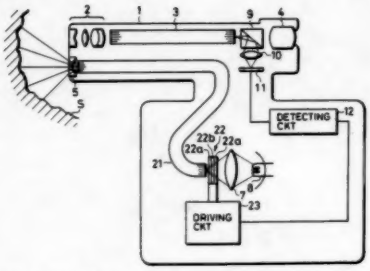
Kimihiko Nishioka, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,240

Claims priority, application Japan, Jul. 5, 1984, 59-137983

Int. Cl.[4] A61B 1/06; G01J 1/32

U.S. Cl. 250—205 14 Claims



1. An illuminating optical system for endoscopes, comprising:

a light guide with first and second ends, said light guide being comprised of a plurality of optical fibers arranged such that a light input at said first end of said light guide corresponds to a light output at said second end of said light guide;

a light source disposed opposite said first end of said light guide;

electro-optic means disposed between said light source and said first end of said light guide, said electro-optic means being divided into a plurality of segments, each of said segments corresponding to at least one of said optical fibers, said segments being controllable as to their light transmissivity;

detecting means for detecting a brightness distribution of the light output at said second end of said light guide on an object to be observed; and

driving means, responsive to said detecting means, for controlling said electro-optic means such that the quantity of light transmitted by a segment to said corresponding optical fibers is reduced when said detecting means detects that the quantity of light transmitted through said corresponding optical fibers is greater than a predetermined value.

4,678,901

OPTICAL SENSOR FOR MONITORING CIGARETTE GROUPS

Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,469

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407168

Int. Cl.[4] H01J 40/14

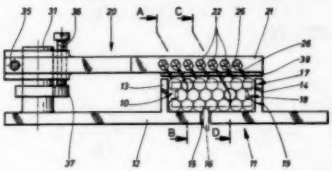
U.S. Cl. 250—223 R 8 Claims

1. A device for monitoring the completeness of groups of cylindrical elongated cigarettes being conveyed along a conveying path in a direction parallel to the longitudinal dimension of the cigarettes, each group consisting of at least an upper layer and a lower layer of cigarettes, the upper layer being complete when it has a predetermined number of cigarettes therein arranged side-by-side with their longitudinal axes parallel to one another, said device comprising:

optical scanning means, including a plurality of light transmitters and light receivers, for optically scanning the

upper layers of moving groups of cigarettes, without physical contact, with respective check beams which form respective light spots on the longitudinal cylindrical upper surfaces of the cigarettes,

the number of said transmitters and the number of said receivers each being equal to said predetermined number; and



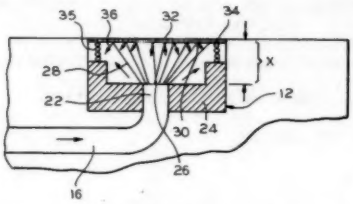
said receivers being positioned to receive reflected light beams respectively reflected from the cylindrical surfaces of corresponding cigarettes in the upper layers, so that the lack of receipt of a reflected light beam by any one of said receivers causes to be triggered a signal indicative of an incomplete upper layer of cigarettes.

4,678,902

FIBER OPTIC TRANSDUCERS WITH IMPROVED SENSITIVITY

Alfred R. Perlin, Highland Park, Ill., assignor to Metatech Corporation, Northbrook, Ill.

Filed Apr. 30, 1985, Ser. No. 729,155
Int. Cl.⁴ H01J 5/16
U.S. Cl. 250—227 **7 Claims**



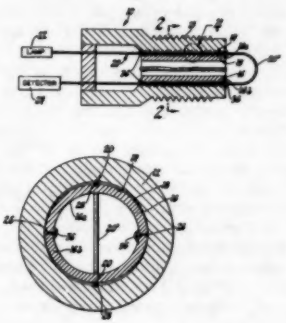
1. A fiber optic transducer comprising a single optical fiber and a movable member having a reflective surface thereon, said single optical fiber providing means for transmitting light in a first direction toward a first end of said fiber where the transmitted light is projected out of the fiber as a cone of light which impacts said reflective surface of said movable member and is reflected off of said surface as a modulated cone of light directed toward said first end of said fiber at which a portion of said modulated reflected cone of light reenters the fiber and is transmitted through said fiber in a second direction toward a second end thereof and means in the structure of the fiber for producing said cone of light comprising a bend in the fiber adjacent said first end thereof whereby an expanded cone of light which is assymetric to the axis of the fiber is projected out of the fiber and whereby sensitivity to movement of said reflective surface of said movable member is enhanced.

4,678,903

SELF ALIGNING FIBER OPTIC MICROBEND SENSOR

Marek T. Wlodarczyk, Sterling Heights; Mark K. Krage, Royal Oak, and Michael J. O'Rourke, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 27, 1986, Ser. No. 822,340
Int. Cl.⁴ G01L 1/24
U.S. Cl. 250—227 **5 Claims**



1. A self aligning microbend sensor comprising

a tubular housing having internal threads,

an expandable insert with external threads loosely threaded into the housing with sufficient tolerance to allow expansion of the insert in response to a parameter being measured, and

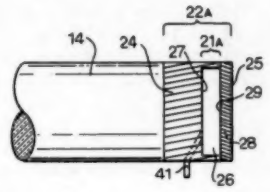
a fiber optic element between the housing and the insert and extending transverse to the threads, such that upon expansion of the insert the fiber optic element experiences microbending due to deformation by the threads.

4,678,904

OPTICAL MEASURING DEVICE USING A SPECTRAL MODULATION SENSOR HAVING AN OPTICALLY RESONANT STRUCTURE

Elric W. Saaski, Bothell, and James C. Hartl, Woodinville, both of Wash., assignors to Technology Dynamics, Inc., Woodinville, Wash.

Filed Jul. 6, 1984, Ser. No. 628,813
Int. Cl.⁴ H01J 5/16
U.S. Cl. 250—227 **50 Claims**



1. An optical measuring device for measuring a range of values for a sensed physical parameter, comprising:

a source of input measuring light of at least two wavelengths;

an optically resonant structure having an optically sensitive physical characteristic which changes as a function of said sensed physical parameter, said optically resonant structure producing spectrally modulated output measuring light by spectrally modulating said input measuring light as a function of said changes of said optically sensitive physical characteristic by means of corresponding micro-

shifts produced by said changes on at least one operating segment on an output curve, said output curve representing at least one of the reflectivity and transmissivity curves of said optically resonant structure;

said input measuring light, said optically resonant structure and said at least one operating segment being selected such that: (1) said at least two wavelengths of said input measuring light fall substantially within said at least one operating segment which, over said range of values for said sensed physical parameter, is less than about one resonance cycle in length and is microshifted less than about one resonance cycle, and such that (2) said spectrally modulated output measuring light of said optically resonant structure bears a unique one-to-one relation to said sensed physical parameter over said range of values;

detector means for deriving two electrical signals corresponding to any two different wavelength portions of said spectrally modulated output measuring light and for taking the ratio of said two electrical signals to provide an output measuring electrical signal which is a function of said sensed physical parameter; and

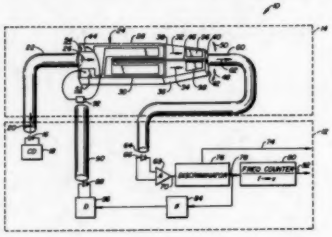
light transmission means for conveying said input measuring light from said source to said optically resonant structure and for conveying said spectrally modulated output measuring light from said optically resonant structure to said detector means.

4,678,905

OPTICAL SENSORS FOR DETECTING PHYSICAL PARAMETERS UTILIZING VIBRATING PIEZOELECTRIC ELEMENTS

Stephen R. Phillips, Walnut Creek, Calif., assignor to Luxtron Corporation, Mountain View, Calif.

Filed May 18, 1984, Ser. No. 612,060
Int. Cl.[4] G01D 5/34; G01L 9/00
U.S. Cl. 250—227 **61 Claims**



1. A transducer apparatus for detecting a physical parameter comprising:

a piezoelectric member which transmits light; means for supplying light to the member, so that the light supplied is transmitted through the member;

means for vibrating the member in a direction transverse to the light transmitted in the member so that the vibrations of the member is modulated by the physical parameter, and so that said modulations of the vibrations also modulate the intensity of the light transmitted by the member; and

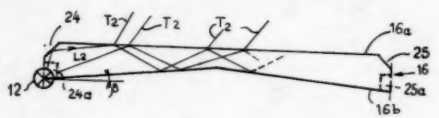
means for detecting modulations of the intensity of the light transmitted by the member to detect said physical parameter.

4,678,906

DEVICE FOR TRANSMITTING THROUGH AN OPTICAL COUPLING DATA ISSUING FROM A STEERING WHEEL TO AN ELEMENT MOUNTED ON A VEHICLE

Alain Rudi, Essert, and Maurice Bertot, Montbeliard, both of France, assignors to Aciers et Outillage Peugeot, Audincourt, France

Filed Nov. 22, 1985, Ser. No. 800,871
Claims priority, application France, Nov. 27, 1984, 84 18064
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 **5 Claims**



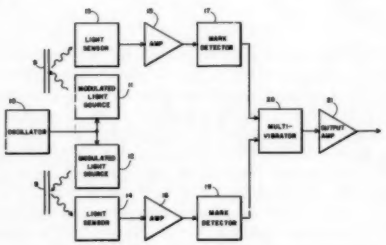
1. A device, in combination with a plurality of control elements which are mounted on a steering wheel of a motor vehicle and which emit data and a system recognizing said data and mounted on the vehicle, for transmitting said data from said control elements to said system, said device comprising a plurality of light sources mounted on the steering wheel and respectively connected to said control elements, annular means coaxial with the steering wheel, photosensitive detectors mounted on the vehicle and corresponding to said light sources, said light sources being disposed in such manner as to cooperate with said annular means so as to transmit light to said corresponding detectors irrespective of the position of each photosensitive detector relative to the light source with which it is coupled, said photosensitive detectors being adapted to actuate loads corresponding to the actuated ones of said control elements, each of the light transmitting annular means comprising a planar side disposed in confronting relation to the corresponding photosensitive detector and in which side is formed at least one notch, and a side for reflecting the light propagated in said annular means in which reflecting side is provided at least one recess in which at least one light source is disposed, and wherein said rereflecting side corresponds in projection, when viewed from a side, to two straight lines defining a wide V-shaped recess.

4,678,907

OPTICAL SCANNER AND SENSOR FOR MONITORING POWER CONSUMPTION

Jerzy A. Lipski, Coquitlam, and Ian R. Bardsley, Port Coquitlam, both of Canada, assignors to Microtel Limited, Burnaby, Canada

Filed Jun. 21, 1984, Ser. No. 622,897
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE **12 Claims**



1. An optical scanner/pulse initiator for electric power meters of a type having a rotor that may be marked with a non-reflective coating, said scanner comprising:

first and second light source means respectively having first and second light beams capable of being modulated ON

and OFF, said first and second beams positioned to reflect off of spatially separated points on said rotor such that when said rotor rotates said non-reflective mark will traverse said spatially separated points;

oscillator means for modulating said first and second light source means ON and OFF at a rate R and with an OFF period of P;

first light sensor means positioned to receive said first light beam after being reflected by said rotor, said first light sensor means providing an indication when the period of time said first beam is OFF is greater than P;

second light sensor means positioned to receive said second light beam after being reflected by said rotor, said second light sensor means providing an indication when the period of time said second beam is OFF is greater than P;

output means responsive to said first and second light sensor means and providing an output signal upon receiving said indication from each of said first and second light sensor means.

4,678,908

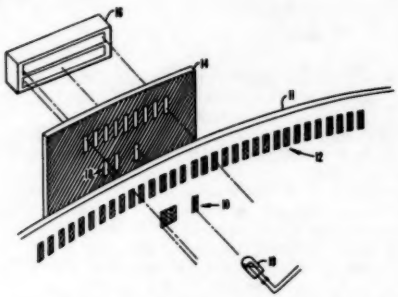
ZERO REFERENCE GENERATING METHOD AND APPARATUS FOR OPTICAL ENCODERS

Dale LaPlante, Goleta, Calif., assignor to BEI Electronics, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 517,322, Jul. 25, 1983, Pat. No. 4,602,155. This application Dec. 5, 1984, Ser. No. 678,499

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **14 Claims**



1. An encoder for providing positional information about a moveable member comprising

code member means couplable to the moveable member for movement with the moveable member;

reference member means positioned to be stationary relative to the code member;

an index sequence positioned at a single zero position on the code member means and on the reference member means comprising a plurality of index patterns, wherein each of the plurality of index patterns comprises a mask component positioned on the reference member means and a corresponding code disk component positioned on the code member means, and wherein for each of the plurality of index patterns the mask component includes a plurality of unit width indicia and the code disk component includes a different plurality of unit width indicia, and further wherein the mask components of each of the plurality of index patterns are separated from one another, and the code disk component of each of the plurality of index patterns are separated from one another, by predetermined spacings; and

means for detecting the degree of registration between the mask and code disk components of the index sequence.

4,678,909

OPTICAL PRESSURE SENSING APPARATUS

David A. Jackson, Canterbury, England; Michael Corke, Wheaton, Ill.; Alan D. Kersey, Washington, D.C., and Julian D. C. Jones, Sittingbourne, England, assignors to Kent Scientific and Industrial Projects Limited, Canterbury, England

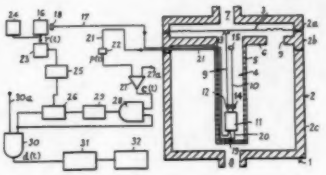
PCT No. PCT/GB85/00136, § 371 Date Nov. 25, 1985, § 102(e) Date Nov. 25, 1985, PCT Pub. No. WO85/04473, PCT Pub. Date Oct. 10, 1985

PCT Filed Apr. 1, 1985, Ser. No. 810,324

Claims priority, application United Kingdom, Mar. 31, 1984, 8408383

Int. Cl.[4] G01B *11/02*

U.S. Cl. 250—231 P **10 Claims**



1. Optical pressure sensing apparatus comprising in combination:

a resilient pressure responsive element,

means mounting said pessure responsive element for displacement in response to differential pressure applied to said pressure responsive element,

optical fibre interferometer means arranged to sense pressure induced displacement of said pressure responsive element, said interferometer means including an optical fibre signal arm, an optical fibre reference arm, optical input means for launching light into said signal and reference arms to propagate light beams therein, and output means for combining said light beams propagated in said signal and reference arms to produce an interference signal at said output means,

said signal and reference arms being mounted to respond similarly to physical perturbations other than the pressure measurand,

means coupling said signal arm to said pressure responsive element so that the length of the optical path defined by said signal arm changes relatively to that of said reference arm in response to said pressure induced displacement of said pressure responsive element,

a light source coupled to said input means of said interferometer device, and

processing means coupled to said output means for monitoring said interference signal at said output means to determine the optical phase shift between said light beams propagated in said signal and reference arms and produce an output signal corresponding to said differential pressure.

4,678,910

REFERENCE POSITION-DETECTING DEVICE FOR PHOTOELECTRIC ENCODER

Masato Hara, and Atsumi Kaneko, both of Tokyo, Japan, assignors to Asahi Optical Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,590

Claims priority, application Japan, Apr. 27, 1984, 59-87434

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—237 G **3 Claims**

1. A reference position-detecting device for use with a photoelectric, incremetal encoder including a main scale having a first pattern of open and closed regions alternately arranged at regular intervals with the regions having the same widths; an index scale having a second pattern of open and closed regions; first light emitting and receiving means for producing a sinu-

soidal signal from said first and second patterns when said scales move relative to each other; said reference positon-detecting device comprising:

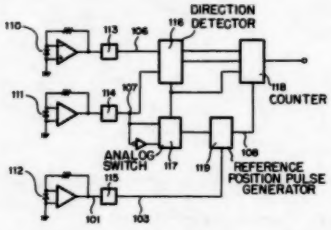
a first random pattern of open and closed regions on said main scale and associated with said first regular pattern;

a second random pattern of open and closed regions on said index scale similar to said first random pattern and associated with said second regular pattern;

second light emitting and receiving means for producing a first electric signal when said random patterns are generally in a reference position;

first pulse generating means responsive to said first electrical signal for producing a first pulse electrical signal;

second pulse generating means responsive to said sinusoidal signal for producing a second pulse electrical signal having leading and trailing edges;



third pulse generating means responsive to said sinusoidal signal for producing a third pulse electrical signal having leading and trailign edges, said second and third pulse electrical signals being 90° out of phase with each other;

direction detection means coupled to said second and third pulse electrical signals for determining the direction of movement of said main and index scales relative to each other and for producing an output signal; and

fourth pulse generating means responsive to said first, second and third pulse electrical signals and said direction detecting means for producing a fourth pulse electrical signal corresponding to an edge of said second and third pulse electrical signals when said first pulse electrical signal is present, thereby indicating that said main and index scales are substantially in said reference position.

4,678,911

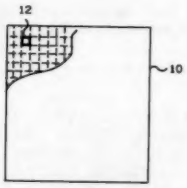
METHOD OF COLLECTING AND PROCESSING SPECTRAL DATA FOR THE EARTH'S SURFACE

Kenneth R. Sundberg, and Keith H. Patton, both of Bartlesville, Okla., assignors to Phillips Petroleum, Bartlesville, Okla.

Filed Jan. 10, 1985, Ser. No. 690,424

Int. Cl.⁴ G01V *5/00*

U.S. Cl. 250—253 **8 Claims**



1. A method of collecting and processing spectral data for a section of the earth's surface, the section being divided into a plurality of subsections hereinafter denoted as pixels, said method comprising the steps:

(a) detecting the intensity of electromagnetic radiation in a first wavelength range reflected from each pixel such than an intensity is detected for each pixel, the first wavelength range being in a band 4 waveband of from about 500 nm to about 600 nm, the intensity as detected for each pixel in this step being denoted as a band 4 intensity value, and wherein there exists a mean band 4 intensity value;

(b) detecting the intensity of electromagnetic radiation in a second wavelength range reflected from each pixel such that an intensity is detected for each pixel, the second wavelength range being in a band 5 waveband of from about 600 nm to about 700 nm, the intensity as detected for each pixel in this step being denoted as a band 5 intensity value, and wherein there exists a mean band 5 intensity value;

(c) computing for each pixel the value of a function $F_4(x)$ corresponding to a band 4 intensity value as detected in step (a), the function $F_4(x)$ being a generally monotonic function of intensity, intensity being represented by variable x, wherein for at least one range of band 4 intensity values which includes the mean band 4 intensity value, $F_4(x)$ changes in value in a first direction as the band 4 intensity increases in value, said change in value in the first direction being either an increasing or decreasing change in value;

(d) computing for each pixel the value of a function $F_5(x)$ corresponding to a band 5 intensity value as detected in step (b), the function $F_5(x)$ being a generally monotonic function of intensity x, wherein for at least one range of band 5 intensity values which includes the mean band 5 intensity value, $F_5(x)$ changes in value in said first direction;

(e) computing for each pixel the value of an alteration index H, each pixel having corresponding $F_4(x)$ and $F_5(x)$ values as calculated in steps (c) and (d), where

$$H(x)=K[F_4(x)-F_5(x)]$$

and where K is constant.

4,678,912

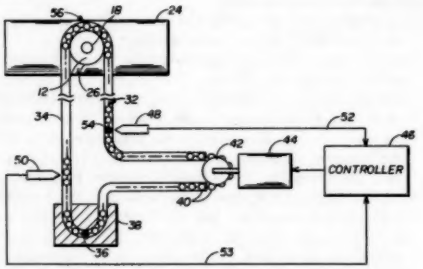
APPARATUS FOR POSITIONING AN EXTERNAL RADIOACTIVE STANDARD IN A LIQUID SCINTILLATION COUNTER

Donald L. Horrocks, Placentia, and Richard S. Kampf, Costa Mesa, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 483,203, Apr. 11, 1983, abandoned, which is a continuation of Ser. No. 277,791, Jun. 29, 1981, abandoned, which is a continuation of Ser. No. 166,225, Jul. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 166,223, Jul. 7, 1980, abandoned. This application Sep. 28, 1983, Ser. No. 537,311

Int. Cl.⁴ G01T *1/00*

U.S. Cl. 250—328 **12 Claims**



1. In a liquid scintillation counter having a counting chamber for receiving a sample containing a scintillator substance and a sample of a radioactive substance to be counted, improved apparatus for positioning a radioactive source in an operating location to irradiate the sample in the counting chamber comprising, in combination:

(1) a continuous bidirectionally flexible conveyor forming a

closed loop for conveying the radioactive source through on operating location and a storage location;

(2) means supporting the radioactive source at a position along the flexible conveyor for conveyance thereby;

(3) guide means for supporting the conveyor and for guiding conveyor movement along a selected path, said path traversing at spaced positions the storage location for the radioactive source remote from the counting chamber and the operating location for the radioactive source near to the counting chamber; and

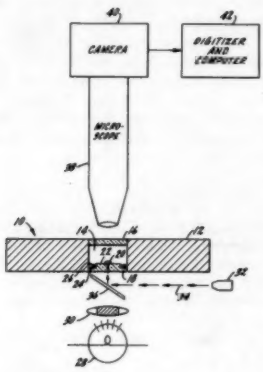
(4) drive means coupled to said continuous flexible conveyor to draw the conveyor around said path for conveying the radioactive source through said spaced storage and operating locations.

4,678,913

METHOD AND APPARATUS FOR ANALYZING THE NATURE OF A SAMPLE

Jack G. Dodd, Jr., and Jeffrey J. Dodd, both of Hamilton, N.Y., assignors to Walter C. McCrone Associates, Inc., Chicago, Ill.

Filed Jan. 6, 1986, Ser. No. 816,262
Int. Cl.[4] G01J 1/00
U.S. Cl. 250—341 **20 Claims**



1. An apparatus for analyzing the absorption spectra of a sample, comprising

a. a container for retaining the sample, said container including

i. a carrier,

ii. a sealed, hollow sample enclosure formed in the carrier,

iii. means forming a transparent path through said enclosure, said path being transparent to both infrared and visible radiation,

iv. a working fluid disposed within said enclosure, said fluid being transparent to infrared radiation,

b. a source of tunable infrared radiation oriented to pass infrared radiation through said enclosure along said path,

c. a visible light source oriented to pass visible radiation through said enclosure, and

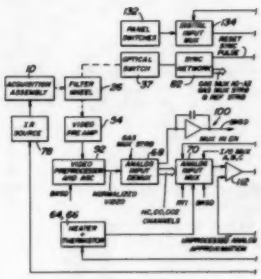
d. means for capturing and storing an image of a sample within said enclosure.

4,678,914

DIGITAL IR GAS ANALYZER

Richard C. Melrose, and Lionel D. McIntosh, both of Huntsville, Ala., assignors to Environmental Tectonics Corporation, Southhampton, Pa.

Filed Apr. 30, 1984, Ser. No. 605,702
Int. Cl.[4] G01J 1/00
U.S. Cl. 250—343 **6 Claims**



1. Digital IR gas analyzer, comprising:

a sample cell having an inlet port and an outlet port for conducting a gas sample therethrough,

an IR radiation source,

means for producing a series of IR radiation samples of the constituents of said gas sample,

means for generating a fixed-amplitude non-background-compensated reference pulse,

means for producing a series of non-background-compensated normalized video pulses corresponding to said constituent radiation samples, said video pulse being normalized with respect to a precision reference voltage and the amplitude of said reference IR pulse,

means for converting said normalized video pulse into digital signals,

means for digitally processing said digital signals, including means for compensating said digital signals for background IR radiation,

means for converting the processed digital signals to analog signals, and

means for driving one or more analog meters in response to the analog signals.

4,678,915

SYSTEM AND PROCESS FOR MEASURING AND CORRECTING THE VALUES OF A PARAMETER OF A SHEET MATERIAL

John Dahlquist, Palo Alto; John Goss, San Jose, and Gunnar Wennerberg, Cupertino, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

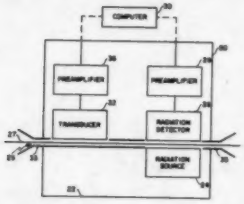
Continuation of Ser. No. 379,377, May 17, 1982, abandoned.
This application Mar. 14, 1985, Ser. No. 711,880
Int. Cl.[4] G01N 27/72; G01R 33/00; G01F 23/00
U.S. Cl. 250—358.1 **17 Claims**

7. A system for measuring the values of a parameter of a sheet of material at various points by a sensor system including head means and for correcting the measured values of the parameter to account for variability of the separation of parts of the head means without measuring the distance from the sensor system to the sheet, the system comprising;

(a) head means having a first part disposed on a first side of the sheet and a second part disposed on a second side of the sheet;

(b) distance sensing means coupled to the head means to measure the distance between the two parts of the head means by transmitting a signal through the sheet;

(c) sensor means coupled to the head means for measuring the values of a parameter of the sheet but not the distance between said sensor means and the sheet to produce uncorrected, measured values;



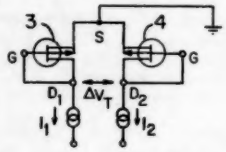
(d) parameter determination means coupled to receive signals from the sensor means and from the distance sensing means for correcting the uncorrected, measured values according to the distance between said two parts of said head means but not according to the distance between the head means and the sheet.

4,678,916

DOSIMETER

Ian Thomson, Nepean, Canada, assignor to Thomson & Nielsen Electronics Ltd., Kanata, Canada

Filed Feb. 10, 1986, Ser. No. 827,509
Claims priority, application Canada, Sep. 18, 1985, 491,034
Int. Cl.[4] G01T *1/24*
U.S. Cl. 250—370 **24 Claims**



1. A radiation dosimeter comprising a pair of silicon insulated gate field effect transistors integrated into the same substrate, each having a gate, a source, and a drain, means for measuring a first differential threshold voltage between the transistors, means for forward biasing the gate of the first transistor and inhibiting operation of the second, while allowing both to be subjected to ionizing radiation, means for measuring a second differential threshold voltage between the transistors following said irradiation, the difference between said differential threshold voltages being indicative of the radiation dosage.

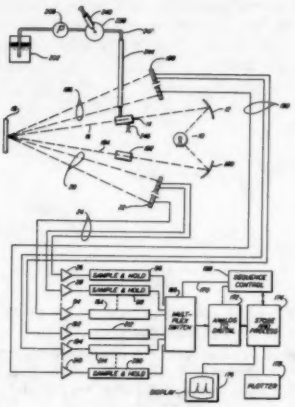
4,678,917

INSTANTANEOUS READING MULTICHANNEL POLYCHROMATIC SPECTROPHOTOMETER METHOD AND APPARATUS

Charles C. Helms, Trumbull; Ralph D. Conlon, Wilton, and Edward B. Delany, Ridgefield, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 19, 1985, Ser. No. 703,260
Int. Cl.[4] G01J *3/36*
U.S. Cl. 250—373 **22 Claims**

5. An improved wide-spectrum spectrophotometer which is operable for substantially instantaneous polychromatic detection and storage of a plurality of spectral segments of radiation to be analyzed comprising a liquid sample cell for containing a sample to be analyzed in solution, a radiation source means for directing a beam of radiation into said sample cell, a diffraction means positioned and arranged to receive illumination emanating from said sample cell as a result of said beam of radiation from said radiation source means, said diffraction means being operable to diffract the emanated radiation into a polychromatic spatially divergent beam, a linear array of photodetectors positioned and arranged to intercept said polychromatic beam with different spectral segments of said beam being intercepted by different photodetectors of said array, a separate signal channel means for each of said photodetectors, each of said signal channel means including a sample-and-hold circuit connected to receive and store signals from each photodetector of said array, control means operable to substantially simultaneously actuate said separate signal channel means and said sample-and hold circuits for all of said photodetectors, analog to digital conversion means connected to said sample-and-hold circuits and operable in response to said control means for converting the held signals to digital form, and digital data storage and processing means connected to receive and store and process the converted stored signals so as to provide spectra analysis information.

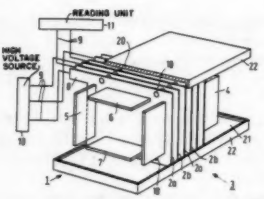


4,678,918

INTEGRATED RADIATION DETECTOR

Joannes L. G. Hermens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,329
Claims priority, application Netherlands, Sep. 26, 1984, 8402927
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—374 **18 Claims**



1. An integrated radiation detector having a detection space which is divided into detector chambers by a number of electrode plates mounted at a mutual distance, characterized in that the electrode plates comprise slots in which electrically insulating gas-tight strips extending through all electrode plates are provided, one of said strips constituting an input window and the remaining strips constituting walls of the detection space,

said strips, together with gas-tight connections between each pair of adjacent electrode plates and the facing edges of the strips, enclosing the detection space.

4,678,919

ELECTRON BEAM EXPOSURE METHOD AND APPARATUS

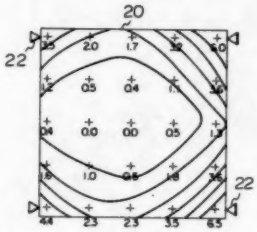
Kenji Sugishima, Kawasaki, and Kenji Nakagawa, Isehara, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 574,726, Jan. 27, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 883,425

Claims priority, application Japan, Jan. 31, 1983, 58-014086

Int. Cl.[4] H01J *37/24*

U.S. Cl. 250—491.1 **10 Claims**



1. An electron beam exposure method for forming a pattern on a workpiece mounted on supporting points, comprising the steps of:

(a) obtaining level data of a surface of said workpiece when said workpiece is subjected to an elastic deformation;

(b) applying correction data to a predetermined pattern data according to which said pattern is formed; and

(c) exposing said elastically deformed workpiece with an electron beam in accordance with the corrected pattern data, so that said pattern is formed on said workpiece when said workpiece is not deformed.

4,678,920

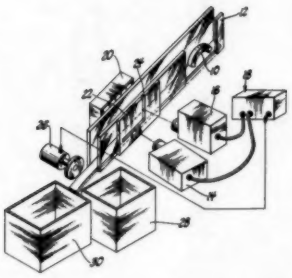
MACHINE VISION METHOD AND APPARATUS

Rene M. Iadipaolo, Southfield, and Richard J. Tkaczyk, Plymouth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1985, Ser. No. 745,079

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—560 **8 Claims**



1. Machine vision apparatus for acquiring the image of a moving object comprising;

means for moving the object along a predetermined path,

a first linear sensor arranged to track the progress of the object along the path and for generating signals representing object position,

a second linear sensor arranged to sense portions of the object in a plane transverse of the path for generating streams of data representing line images in the plane, and

synchronizing means coupled to the sensors and responsive to the signals for outputting streams of data from the second sensor at predetermined object positions whereby as the object advances through the plane the second sensor obtains many line images which cumulatively represent an image of the object.

4,678,921

PHOTO-ELECTRIC SMOKE DETECTOR WITH LIGHT SHIELDING ELECTRODE

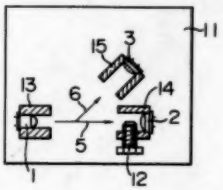
Takehiro Nakamura, Nishio; Susumu Sato, Okazaki; Tadashi Hattori, Okazaki; Teiichi Nabeta, Okazaki, and Minoru Kato, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Feb. 11, 1985, Ser. No. 700,383

Claims priority, application Japan, Feb. 13, 1984, 59-25357

Int. Cl.[4] G01N *15/06*

U.S. Cl. 250—574 **8 Claims**



4. A photoelectric smoke detector comprising:

a chamber defining a flow path for smoke;

light emitting means provided in said chamber;

first light receiving means arranged at a predetermined angle relative to said light emitting means, for receiving only a scattered light;

second light receiving means arranged in line with said light emitting means, for receiving light directly therefrom;

regulation means for regulating an amount of light incident on said second light receiving means; and

said second light receiving means having an electrode acting as a light shielding member for shielding only a part of a light receiving surface thereof, said second light receiving means having a light shielded area, which is larger than a light shielded area of said first light receiving means, and having a light sensitivity of which is smaller than a light sensitivity of said first light receiving means.

4,678,922

AIR MOTOR HAVING INTEGRAL GENERATOR

Jon J. Leininger, P.O. Box 12, DePere, Wis. 54115

Filed Dec. 5, 1985, Ser. No. 792,821

Int. Cl.[4] F03B *13/00*

U.S. Cl. 290—54 **8 Claims**

1. An improved air tool, comprising:

A. a tool housing having a closed outer wall;

B. a motor for powering the tool positioned within said housing, including:

1. a rotor assembly comprising:

a. a shaft mounted for rotation within said housing; and

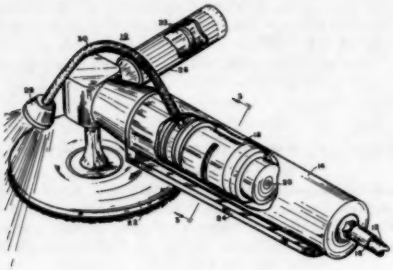
b. a rotor body affixed to said shaft; and

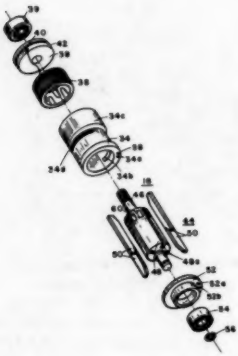
c. a plurality of vanes connected to said rotor body;

2. means integrally formed in said housing for allowing compressed air to enter and for directing said compressed air against said vanes thereby causing said rotor assembly to rotate by the force of compressed air against said vanes;

C. generator means comprising a stator positioned within said housing coaxially with said rotor assembly, said rotor

assembly having magnetic means for cooperating with said stator and thereby generating electrical energy for powering an electrical appliance connected to the tool while said rotor assembly is rotated by said compressed air.





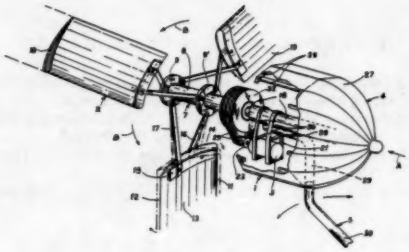
4,678,923

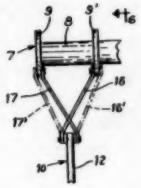
WINDMILL

Fernand Trepanier, 680 - 30th Street, St. Georges Ouest, Beauce County, Quebec, Canada G5Y 4H4

Filed Nov. 13, 1985, Ser. No. 841,479
Int. Cl.[4] F03D 7/00
U.S. Cl. 290—55 **5 Claims**

1. In a windmill, a variable pitch air-screw comprising a hub, a generally horizontally-supported stationary shaft on which said hub is mounted for free rotation, a resilient support for connecting said shaft to a ground-standing supporting tower; at least two rotatable blades, each blade radially extending from said hub and defining a root radially spaced from said hub; one and another collar fixedly mounted axially spacedly on said hub on respective opposite sides of the rotational plane of said blades; each blade having an air-foil profile with a thicker leading edge; a thinner trailing edge; a main concave surface and an opposite convex surface; first and second resilient strips for each blade, the first strip rigidly connected at one end to said one collar and at its other end to the convex surface of one blade root proximate the blade leading edge, the second strip rigidly connected at one end to said another collar and at its other end to the concave surface of the same one blade root proximate its trailing edge; said strips being oppositely inclined to each other and each crossing the rotational plane of said blades; whereby increase of the centrifugal force exerted on said blades will decrease the inclination of said strips and cause rotation of each blade about its longitudinal axis relative to said hub, to thereby increase the pitch of the blades with increase of the rotational speed of said air-screw.



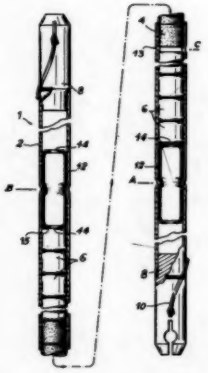


4,678,924

METHOD OF SETTING A STOP MEANS INSIDE OF A TUBULAR ELEMENT

Pierre Loriot, Venelles; Michel Rendu; Jean Rousseau, both of Aix en Provence, and Alain Samoel, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 418,180, Sep. 14, 1982, abandoned. This application Jul. 3, 1985, Ser. No. 751,431
Claims priority, application France, Sep. 30, 1981, 81 18414
Int. Cl.[4] G21C 21/00
U.S. Cl. 29—407 **2 Claims**



1. Method of affixing a stop means to the inside of a nuclear reactor fuel rod can having a length, said method being characterized in that:

the said stop means is a hollow cylinder of deformable but undeformed walls;

the said nuclear reactor fuel rod can has a deformable wall, but it is likewise undeformed;

and in that it includes the following successive steps:

providing a reference mark or level at a certain point along the length of the can;

introduction of said undeformed stop means into the nuclear reactor fuel rod can;

positioning a reference surface of said undeformed stop means inside of the nuclear reactor fuel rod can between an upper and a lower predetermined positioning limit, or at least level with said upper positioning limit, each of said upper and lower predetermined positioning limit being located at a predetermined distance, respectively, from said reference mark or level; and

performing a simultaneous operation of setting the nuclear reactor fuel rod can and the stop means at a position located at a predetermined distance from said predetermined mark or level along the length of the said nuclear reactor fuel rod can;

the stop means having a length at least equal to the distance between the said upper and lower predetermined limits.

4,678,925

DASHBOARD LIGHTING ADJUSTMENT FOR A MOTOR VEHICLE

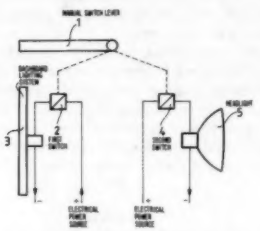
Diethelm Grocke, Schnieglinger Str. 132, Nuremberg 90, Fed. Rep. of Germany 8500

Filed Jan. 13, 1986, Ser. No. 818,330

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500918

Int. Cl.⁴ H02G *3/00*

U.S. Cl. 307—10 LS **2 Claims**



1. An illuminating system for a motor vehicle, comprising:

headlamps which are selectively actuatable to selectively operate on low beam and high beam illumination;

a dashboard illumination means which is adjustable between a first stage which produces relatively dim dashboard lighting, and a second stage which produces relatively bright dashboard illumination;

a first switch means for switching said headlamps between said low beam and said high beam illumination;

a second switch means for switching said dashboard illumination means between said first stage which produces relatively dim lighting and said second stage which produces relatively bright lighting;

a manually operated control means for operating said first switch means and said second switch means in a single operation of said manually operated control means;

whereby said low beam illumination is switched on along with said first stage which produces said dim dashboard illumination; and said high beam illumination is switched on along with the second stage which produces relatively bright dashboard illumination.

4,678,926

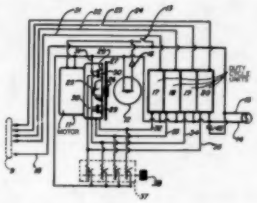
CHRISTMAS TREE LIGHTING CONTROL

George B. Davis, 7512 Marbury Rd., Bethesda, Md. 20034

Filed Feb. 5, 1986, Ser. No. 826,369

Int. Cl.⁴ H02J *3/00*

U.S. Cl. 307—11 **2 Claims**



1. An ornamental lighting control including in combination, a plurality of solid state duty cycle units having a common input and respectively variable duty cycle outputs, connector means respectively connected to each unit's output for connecting thereto an ornamental lighting source with the duty cycle of the output determining the light output intensity of a lighting source connected therewith, an RC gating circuit included in each duty cycle unit and wherein the resistance value of the gating circuit resistor determines the duty cycle of the unit and output thereof, a plurality of photoelectric cells with each of said cells being respectively connected within the RC gating circuitry of each of said duty cycle units and responsive individually to varying light intensities applied thereto vary respectively in resistance as required to effect corresponding duty cycle changes in its associate duty cycle unit and output thereof, light applying means positioned to apply light respectively to each of said cells, light control means operable to effect random like occurring variations in the light as respectively applied to each of said cells whereby the applied varying light pattern between cells differ one from the other for a predetermined operating interval of said light control means and a variable resistor respectively connected in parallel with each of said photoelectric cells and manually adjustable in resistance to vary selectively the duty cycle of its related duty cycle unit and output thereof.

4,678,927

CIRCUIT ARRANGEMENT FOR LARGE POWER TRANSFORMERS

Werner Stein, Nuremberg, and Walter Müller, Schwabach, both of Fed. Rep. of Germany, assignors to Transformatoren Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,239

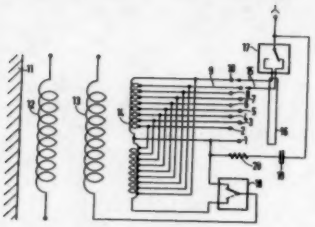
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338149

Int. Cl.⁴ H01F *37/00*

U.S. Cl. 307—104 **4 Claims**

1. Circuit arrangement for large power transformers with a low-voltage winding, a main high-voltage winding and a step winding as well as a step switching device at a Y-point side thereof, comprising, at a location between the center of the step winding connecting the step winding to the high-voltage main winding and the Y-point of the transformer, a capacitor in series with a resistor connected electrically parallel to respectively voltage-addingly connected current-carrying steps of the step winding, said capacitor and said resistor being of such dimensions as to decrease resonance amplitudes of said con-

necting point to ground, said capacitor being constructed of spirally wound strip lines formed of a resistance alloy, said



strip lines being also of such dimensions as to reduce resonance amplitudes of said connecting points.

4,678,928

CONTROLLER FOR AUTOMATICALLY EFFECTING DISENGAGEMENT OF BUCKLE DEVICE

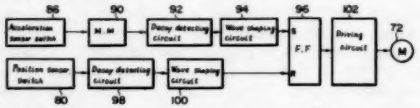
Yuji Nishimura; Akinori Fujiwara, and Shigeyasu Kanada, all of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Dec. 18, 1985, Ser. No. 810,205

Claims priority, application Japan, Dec. 26, 1984, 59-199396[U]

Int. Cl.[4] B60R *21/00*

U.S. Cl. 307—10 SB **16 Claims**



1. A controller for automatically effecting disengagement of a buckle device in a vehicle, comprising:

moving means for moving a lock plate which is engaged with a tongue plate;

emergency sensor means for detecting an emergency situation of the vehicle;

door sensor means for detecting whether a door of the vehicle is opened or closed;

normal disengagement control means for activating said moving means when said door sensor means detects that the door is opened to move said lock plate in a direction in which said lock plate and said tongue plate are disengaged from each other; and

emergency disengagement control means for activating said moving means when a predetermined period of time has elapsed after an emergency situation of the vehicle has been detected by said emergency sensor means to move said lock plate in a direction in which said lock plate and said tongue plate are disengaged from each other by a driving force larger than a driving force produced by said moving means in response to said normal disengagement control means.

4,678,929

RADIO FREQUENCY SWITCH

Feroz K. Alpaiwalla, and Robert H. Begeman, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1985, Ser. No. 781,633

Int. Cl.[4] H01H *63/36*; H04N *5/22*

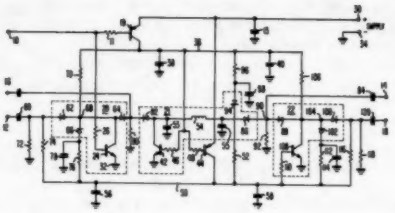
U.S. Cl. 307—112 **18 Claims**

1. A system including a signal input port and a signal output port; a control input for receiving a mode selection signal; and signal switch apparatus for coupling a signal between said input port and said output port when a first operating mode is selected in response to said mode selection signal and substantially not coupling said signal between said ports when said second operating mode is selected in response to said mode selection signal, said signal switch apparatus comprising:

a pair of diodes having respective first electrodes of a first type and respective second electrodes of a second type, said diodes being coupled in series with said respective first electrodes being coupled to a circuit point and said respective second electrodes being coupled to respective ones of said input port and said output port;

a shunt diode having a first electrode of said first type and a second electrode of said second type, said first and second electrodes of said shunt diode being coupled to a point of reference potential and to said circuit point, respectively;

transistor means having a control electrode and having a principal controllable conduction path coupled between said circuit point and said point of reference potential; and



control means coupled to said control input and being responsive to said mode selection signal selecting said first operating mode for applying bias potential tending to forward bias said pair of diodes and tending to reverse bias said shunt diode, and for applying control potential to the control electrode of said transistor means for rendering substantially non-conductive the principal controllable conduction path thereof;

said control means being responsive to said mode selection signal selecting said second operating mode for applying bias potential tending to forward bias said shunt diode, tending to reverse bias said pair of diodes and for applying control potential to the control electrode of said transistor means for rendering substantially conductive the principal controllable conduction path thereof.

4,678,930

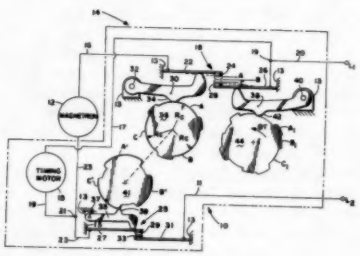
MICROWAVE OVEN TIMER

Joseph J. Mahon, Libertyville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 5, 1986, Ser. No. 826,434

Int. Cl.[4] H01H *43/00*

U.S. Cl. 307—141 **22 Claims**



1. A programmable control system for an electrically energized appliance comprising:

(a) load means operable upon connection to a power line to perform a predetermined function;

(b) switch means series connected with said load means and operable upon actuation to connect said load means to said power line for electrical current flow thereto and operable upon deactuation to disconnect said load means from said power line, said switch means having a pair of electrical contacts each mounted on a moveable blade means and having:

(i) interval cam means including follower means contacting said switch means and knob means operable upon appliance user selection of one of a first second and third rotary positions of said knob means to move one of said moveable switch blades to one of a first, second and third predetermined positions for a selecting power level for load means operation and said selection of said cam means position also operable to include selection of the time duration of said interval for programming said load means;

(d) a timing motor and speed reducer means;

(e) cam advance means connected to said speed reducer means operable to advance said cam means at a pre-determined rate for time out of said selected interval;

(f) sub-interval cam means operable upon cyclic advance to move the other of said moveable blade means through a first, second and third positions for effecting cyclic actuation of said pair of contacts;

(g) sub-interval advance means connected to said speed reducer means and operable to cyclically advance said sub-interval cam means at a certain multiple of the rate of said cam advance means;

(h) said one blade means in said first position operable to provide a first fractional duty cycle for said load means during said selected program interval, said one blade means in said second position operable to provide a second fractional duty cycle substantially greater than said first fraction for said load means during said selected program interval, and said one blade means in said third position operable to provide 100% duty cycle, or full "ON", for said load means during said selected program interval.

4,678,931

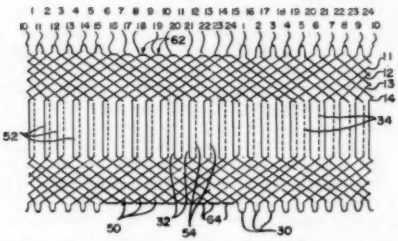
ARMATURE WINDING FOR LARGE TURBINE GENERATOR

Dwight Olsen, Concord, Calif., and Robert L. Wall, Delanson, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 789,183, Oct. 18, 1985, Pat. No. 4,635,350. This application Jul. 29, 1986, Ser. No. 890,240

Int. Cl.[4] H02K *3/04*

U.S. Cl. 310—201 **6 Claims**



1. A dynamoelectric machine comprising, in combination:

A. a magnetizable member having a cylindrical surface;

B. a plurality of axially extending slots uniformly spaced in said member and opening into said surface, each of said slots having upper and lower slot positions; and

C. a winding including a first segment comprised of a succession of diamond coils and a second segment comprised of a succession of bar coils,

(1) said diamond coils each having first and second coil sides integrally interconnected by end turn sections, said diamond coils being placed on said member with said first coil sides disposed in upper slot positions of respective ones of said slots and said second coil side disposed in lower slot positions of respective different ones of said slots, the number of said slots circumferentially separating said first and second coil sides of each said diamond coil being equal to the pitch thereof,

(2) said bar coils each having first and second bars electrically interconnected at their respective terminations by separate end turn electrical joints, said first bars disposed in respective lower slot positions of those of said slots whose upper slot position are occupied by said first coil sides of the initially placed group of said diamond coils equal in number to said diamond coil pitch, and said second bars disposed in respective upper slot positions of those of said slots whose lower slot positions are occupied by said second coil sides of the lastly placed group of said diamond coils equal in number to said diamond coil pitch.

4,678,932

SNUBBER CIRCUIT FOR GTO THYRISTOR

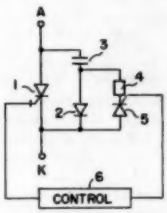
Minoru Tanaka, and Yuzuru Yonehata, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1986, Ser. No. 857,049

Claims priority, application Japan, Apr. 30, 1985, 60-92710

Int. Cl.[4] H03K *17/72*

U.S. Cl. 307—633 **4 Claims**



1. A snubber circuit for a GTO thyristor comprising a series-connected member of a capacitor and a diode connected in parallel with a GTO thyristor and a series-connected member of a resistor and a thyristor connected in parallel with said diode.

4,678,933

SOLID STATE RELAY FOR AEROSPACE APPLICATIONS

Alessandro Pedone, L'Aquila, Italy, assignor to Selenia Spazio SpA, L'Aquila, Italy

Filed Jan. 16, 1985, Ser. No. 692,037

Claims priority, application Italy, Jan. 23, 1984, 35532/84[U]

Int. Cl.[4] H03K *17/60, 3/45*

U.S. Cl. 307—254 **6 Claims**

1. A solid state relay for controlling an alternating current circuit having an alternating current source and an alternating current load, said solid state relay comprising:

a current transformer having

a primary winding connected in series with said source and said load, and

a secondary winding having a center-tap at ground potential and a pair of terminals;

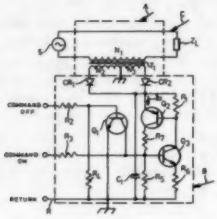
a pair of diodes each having two sides, one side of each diode being connected to a respective one of said terminals;

a first transistor circuit having a first transistor with a base,

an emitter and a collector, the other sides of said diodes being connected to said emitter of said first transistor;

a second transistor circuit having a second transistor with an emitter and a collector forming an emitter/collector path of said second transistor circuit, and further having a base, the base of said first transistor being connected to said emitter/collector path of said second transistor circuit;

a third transistor circuit having a third transistor with an emitter and a collector forming an emitter/collector path of said third transistor circuit, and further having a base, said base of said second transistor being connected to the emitter/collector path of said third transistor circuit;



resistive means connected to the collector of said first transistor and to the base of said second transistor;

means for applying an ON command to said base of said second transistor so as to short-circuit said secondary winding to render said primary winding conductive to alternating current; and

means for applying an OFF command to said base of said third transistor so as to open-circuit said secondary winding for blocking alternating current flow through said primary winding.

4,678,934

FLIP-FLOP CIRCUIT

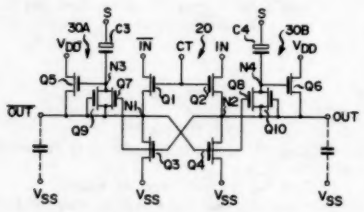
Koichi Magome; Haruki Toda; Hiroyuki Koinuma, all of Yokohama; Hiroshi Sahara, Tokyo; Kiminobu Suzuki, Yokohama; Shigeo Ohshima, and Kenji Komatsu, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 11, 1986, Ser. No. 884,629

Claims priority, application Japan, Jul. 16, 1985, 60-156513

Int. Cl.[4] H03K *3/26, 17/687, 19/094;* **G11C** *7/00*

U.S. Cl. 307—279 **16 Claims**



1. A flip-flop circuit comprising:

a first power terminal set at a potential of a first level;

first and second output terminals;

latching means for charging one of said first and second output terminals to a potential of the first level and discharging the other one of said first and second output terminals to a potential of a second level lower than the first level, thereby latching an input signal; and

a first potential compensation means for compensating a potential drop of said first output terminal, said potential compensation means including:

a first pull-up transistor having an insulated gate and a current path connected between said power and first output terminal, a first charging means for charging said insulated gate while the potential of said second output terminal is changed from the first level to the second level, a first bootstrap means for bootstrapping the potential of said insulated gate to turn on said pull-up transistor, and a first diode means, connected in the forward direction from said first output terminal to said insulated gate, for charging said insulated gate when the potential of said insulated gate is dropped by at least a predetermined level in comparison with that of said first output terminal.

4,678,935

INNER BIAS CIRCUIT FOR GENERATING ECL BIAS VOLTAGES FROM A SINGLE COMMON BIAS VOLTAGE REFERENCE

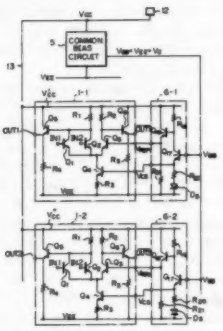
Kazumasa Nawata, Kawasaki, and Yasunori Kansi, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 14, 1984, Ser. No. 650,527

Claims priority, application Japan, Sep. 21, 1983, 58-173197

Int. Cl.[5] H03K *17/16, 19/086*

U.S. Cl. 307—297 **13 Claims**



1. An integrated circuit device comprising:

a cell unit array having a plurality of cell units disposed in a central portion of a semiconductor chip;

a first power supply line and a second power supply line on said chip; and

at least one common bias generating portion disposed on said chip at the periphery of said cell unit array, each said common bias generating portion generating a respective single common bias voltage which differs from the potential of said second power supply line by a first constant value;

each of said cell units including:

at least one logic circuit portion each having at least a pair of logic transistors which are connected to said first power supply line and whose emitters are mutually connected, and a constant current source means connected to said second power supply line for supplying a constant current to said logic transistors; and

an inner bias circuit which receives said common bias voltage and which generates a first inner bias voltage that is supplied to the base of a first one of the logic transistors and a second inner bias voltage that is supplied to said constant current source means;

wherein the value of the respective second inner bias voltage differs from said common bias voltage by a second constant value, and the value of the respective first inner bias voltage differs from the potential of said first power supply line at the respective cell unit by a value determined according to the characteristic values of elements in the respective inner bias circuit and by said common bias voltage at the respective cell unit.

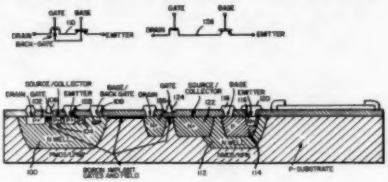
4,678,936
MOS-CASCODED BIPOLAR CURRENT SOURCES IN NON-EPITAXIAL STRUCTURE

Peter R. Holloway, Andover, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Division of Ser. No. 581,288, Feb. 17, 1984. This application Sep. 29, 1986, Ser. No. 912,315

Int. Cl.[4] H03K *3/20, 3/353;* **H01L** *27/02;* **G05F** *3/04*

U.S. Cl. 307—303 **12 Claims**



8. In a monolithic integrated circuit formed on a substrate, an MOS-cascoded bipolar current source connected as part of said monolithic integrated circuit to supply current of fixed value to elements thereof and comprising:

first and second regions of one conductivity type diffused in said substrate to serve as the drain and the source of an MOS device, respectively;

a gate positioned between said first and second diffused regions;

a third region of said one conductivity type diffused in said substrate separate from said first and second regions, said third diffused region serving as the emitter of a bipolar transistor;

a fourth region of a conductivity type opposite said one conductivity type diffused in said substrate between said second and third diffused regions to serve as the base of said bipolar transistor;

said second diffused region serving as the collector of said bipolar transistor as well as serving as the source of said MOS device;

first and second power supply terminals for said integrated circuit; and

circuit means connecting said current source in series with said integrated circuit elements and between said power supply terminals so that said current source controls the flow of power supply current through said elements.

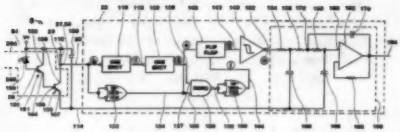
4,678,937
ELECTRICAL ISOLATION CIRCUIT

Timothy D. Price, Barnham, England, assignor to Rosemount Engineering Company Limited, England

Filed Feb. 3, 1984, Ser. No. 576,909

Int. Cl.[4] H03K *3/42;* **G02B** *27/00;* **G02F** *1/00*

U.S. Cl. 307—311 **26 Claims**



1. An isolator circuit for providing dielectric isolation for an input signal which has a leading edge and a trailing edge spaced apart in time, the circuit comprising:

first means for receiving the input signal and for providing a first signal representative of the leading edge of the input signal and for providing a second signal representative of the trailing edge of the input signal; and

isolation means having an isolation input coupled to the first means and having a single isolation output for providing a first isolated signal representative of the leading edge of the input signal and a second isolated signal representative of the trailing edge of the input signal and distinct from the first isolated signal, the isolation means providing signal transmission and dielectric isolation between the isolation input and the isolation output such that the first and second isolated signals are dielectrically isolated from the input signal and the time spacing between the leading edge and the trailing edges is substantially preserved in the isolation output.

4,678,938
SOLID-STATE IMAGE SENSING APPARATUS HAVING AN AUTOMATIC CONTROL LOOP

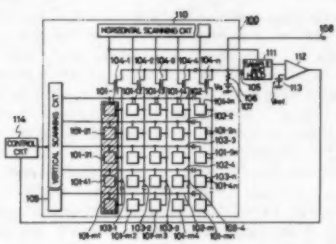
Junichi Nakamura, Nagano, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,787

Claims priority, application Japan, Sep. 28, 1984, 59-203718

Int. Cl.[4] H03K *3/42;* **H01L** *29/78, 27/14;* **H01J** *40/14*

U.S. Cl. 307—311 **5 Claims**



1. A solid-state image sensing apparatus comprising:

a plurality of row lines;

means for applying row selecting control signals to said row lines;

a plurality of column lines;

means for applying column selecting control signals to said column lines;

a plurality of picture elements, including at least one light-shielded picture element, each of said picture elements comprising normally-on type static induction transistors, each of said static induction transistors comprising a first layer of a substrate forming a first main electrode, a second layer of a channel disposed on said substrate, a source formed on the surface of the second layer forming a second main electrode and a gate formed within the second layer adjacent said channel, an insulator disposed on said gate, gate electrodes disposed on said insulator forming a capacitor therebetween, said second main electrode connected to a corresponding one of said column lines, said first main electrode connected commonly to respective first electrodes of other on-type static induction transistors, said channel being disposed between said main electrodes, and said capacitor connected between said gate of each of said static induction transistors and the corresponding one of said row lines;

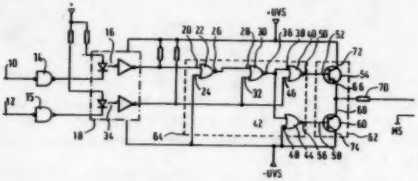
means for reverse-biasing said gates when a signal is read out from each of said picture elements; and

automatic control loop means for controlling the output of each of said light-shielded picture elements such that said output becomes zero and for automatically controlling the output voltage of each of said means for applying row selecting control signals in accordance with the output of a corresponding light-shielded picture element.

4,678,939
OUTPUT CIRCUIT FOR SIGNAL TRANSMISSION SYSTEMS

Hans-Bodo Laue, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Aug. 14, 1985, Ser. No. 765,735
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430338
Int. Cl.⁴ H03K *19/20, 3/26, 19/14*
U.S. Cl. 307—445 **3 Claims**



1. In an improved circuit for signal transmission systems employed to generate a bipolar, transmission-ready transmit signal for delivery to a signal transmission line of a signal transmission system, by driving a power output stage by a data signal and a transmitter release signal via an isolation stage and a logic circuit, whereby the output of the power stage is switched to low resistance in the presence of said transmitter release signal and to high resistance in the absence of said transmitter release signal, the improvement wherein the power output stage (62) is composed of two complementary transistors (54, 60), each of said transistors (54, 60) including a base (52, 58), a collector (72, 74) and an emitter (66, 68), said emitters (66, 68) being connected to a signal transmission line through a common resistor (70), said bases (52, 58) being each separately controlled from and directly connected to an output (50, 56) of the logic circuit (64) so that only one of the two transistors (54, 60) is switched to conducting in the presence of a transmitter release signal corresponding to the polarity of the output signal to be produced, and that both transistors (54, 60) are switched off, independent of the data signal in the absence of a transmitter release signal, and wherein the logic circuit (64) contains a first and second logic element (30, 40) receiving first and second input signals, the first logic element (30) receiving the transmitter release signal and the data signal as the first input signals, the output signal of the first logic element (30) driving both an input (38) of the second logic element (40) and the base of one of the transistors (60), and the second logic element (40) receiving the transmitter release signal as the second input signal and driving the base (52) of the other transistor (54) with its output signal, the first logic element (30) being driven with the data signal via a third logic element (22), an input (24) of the third logic element (22) being driven by a line side supply voltage.

4,678,940
TTL COMPATIBLE MERGED BIPOLAR/CMOS OUTPUT BUFFER CIRCUITS

Nader Vasseghi, Mountain View; Donald G. Goddard, Cupertino, and Robert E. Eccles, Santa Clara, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 8, 1986, Ser. No. 817,228
Int. Cl.⁴ H03K *19/08, 19/003, 17/16, 17/56*
U.S. Cl. 307—446 **25 Claims**

5. An output buffer circuit formed of bipolar transistors and CMOS transistors to provide two output states compatible with TTL levels comprising:

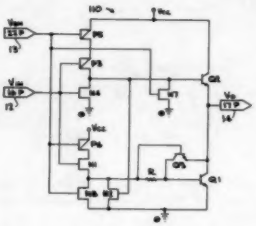
a P-channel MOS transistor having its gate connected to an input terminal and its source connected to a supply potential;

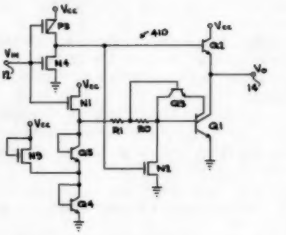
a first bipolar transistor having its collector connected to the supply potential, its base connected to the drain of said P-channel transistor, and its emitter connected to an output terminal;

an N-channel MOS transistor having its gate connected to the input terminal and its drain connected to the supply potential;

a second bipolar transistor having its collector connected to the output terminal, its base connected to the source of said N-channel transistor via a resistor, and its emitter connected to a ground potential;

first discharge means operatively connected to the base of





said first bipolar transistor for quickly turning off the same so as to speed up a low-to-high transition at the output terminal;

second discharge means operatively connected to the base of said second bipolar transistor for quickly turning off same so as to speed up an high-to-low transition at the output terminal; and

anti-saturation means connected between the base and collector of said second bipolar transistor for preventing said second bipolar transistor from being forced further into the saturation region.

4,678,941
BOOST WORD-LINE CLOCK AND DECODER-DRIVER CIRCUITS IN SEMICONDUCTOR MEMORIES

Hu H. Chao, Pleasantville West, and Nicky Chau-Chun Lu, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1985, Ser. No. 727,301
Int. Cl.⁴ H03K *19/096*
U.S. Cl. 307—449 **6 Claims**

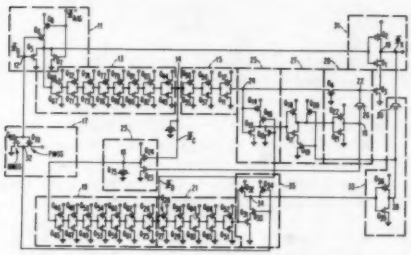
1. A boost word-line clock generator and decoder-driver structure for a semiconductor memory of the type including a row circuit clock signal Φ^{*}_{RAS} a reset clock signal Φ_B, comprising:

a boost word-line clock generator circuit including means responsive to said Φ^{*}_{RAS} and Φ_B signals for producing a boost circuit preset clock signal Φ_C, and a boost trigger clock signal ΦD,

means responsive to said Φ_C signal for producing a delayed Φ_C signal,

means for summing said delayed Φ_C and Φ_D signal,

means for producing a delayed Φ_D signal,
means responsive to said Φ_B signal for producing a delayed Φ_B signal,
means for providing a first NAND function on said delay Φ_B signal and delayed Φ_D signals,
an external boosting means connected to the output of said NAND means for producing an external boost signal,
means for providing a second NAND function on the outputs of said second summing means and said external boost signal,
an internal boost circuit connected to the output of said



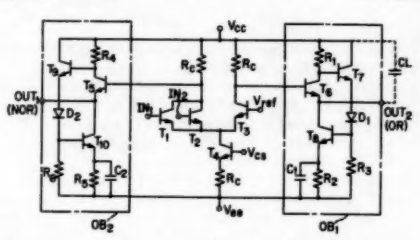
second NAND means for producing an internal boost signal,
a clock driver circuit responsive to said delayed Φ_C signal, the output of said external boost circuit, the output of said internal boost circuit and the output of said summing means for producing a word-line boosting clock signal, and
a decoder-driver means connected to the output of said clock driver circuit of said word-line clock generator circuit, for decoding word-line input signals for producing boost word-line signals for output word-lines of said semiconductor memory.

4,678,942

EMITTER COUPLED LOGIC CIRCUIT WITH HIGH DRIVABILITY FOR CAPACITIVE LOAD

Yasunori Kanai, Inagi, and Taichi Saitoh, Yokohama, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 23, 1985, Ser. No. 779,356
Claims priority, application Japan, Sep. 25, 1984, 59-198606
Int. Cl.[4] H03K *19/01, 19/086*
U.S. Cl. 307—455 **11 Claims**



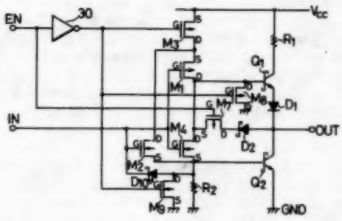
1. An emitter coupled logic (ECL) circuit comprising:
at least a pair of transistors having the emitters thereof coupled together;
an emitter follower transistor for providing an output, said emitter follower transistor having a base connected to the collector of one of said pair of transistors;
an output terminal connected to the emitter of the emitter follower transistor;
a current control transistor connected to the emitter follower transistor; and
a control circuit means coupled to the collector of said emitter follower transistor for detecting the collector current of said emitter follower transistor, and
said control circuit means being connected to the base of said current control transistor for controlling the current through said current control transistor in accordance with the collector current of the emitter follower transistor, so that said current control transistor pulls down the output voltage when the collector current becomes small.

4,678,943

INVERTING LOGIC BUFFER BICMOS SWITCHING CIRCUIT USING AN ENABLING SWITCH FOR THREE-STATE OPERATION WITH REDUCED DISSIPATION

Akira Uragami, Takasaki; Yukio Suzuki, Hinode; Shinji Kadono, Fussa; Masahiro Iwamura, Hitachi; Ikuro Masuda, Hitachi, and Tatsumi Yamauchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1985, Ser. No. 704,209
Claims priority, application Japan, Feb. 24, 1984, 59-32357
Int. Cl.[4] H03K *17/04*
U.S. Cl. 307—473 **13 Claims**



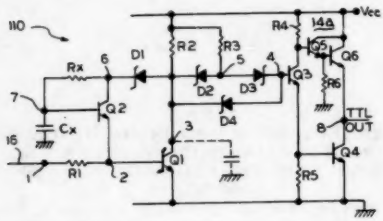
1. A switching circuit comprising:
an output stage having first and second bipolar transistors and having the collector-emitter paths thereof connected in series between a first operating potential and a second operating potential;
a pre-stage circuit having a first field effect transistor having the drain output thereof coupled to the base of said first bipolar transistor to control conduction and non-conduction of said first bipolar transistor and a second field effect transistor having a conductivity type opposite to that of said first field effect transistor and the source output thereof coupled to the base of said second bipolar transistor to control conduction and non-conduction of said second bipolar transistor, the gates of said first and second field effect transistors being commonly connected to an input node and being driven in common by an input signal applied to said input node;
a switching element connected between the source of said first field effect transistor as well as the drain of said second field effect transistor in said pre-stage circuit and said first operating potential, and having the conduction and non-conduction thereof controlled by an enable control signal to thereby control whether or not said pre-stage circuit receives said first operating potential;
a third field effect transistor having a conductivity type opposite to that of said first field effect transistor, receiving said input signal at the gate thereof and having the drain thereof connected to the base of said first bipolar transistor and the source thereof connected to the base of said second bipolar transistor; and
impedance means connected between the base of said second bipolar transistor and said second operating potential.

4,678,944

CIRCUIT FOR IMPROVING PERFORMANCE OF AN ECL-TO-TTL TRANSLATOR

Bertrand J. Williams, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 13, 1985, Ser. No. 733,681
Int. Cl.[4] H03K *19/092, 19/088*
U.S. Cl. 307—475 **12 Claims**



1. A logic level translator having a fast rising edge at its output for converting ECL logic levels into TTL logic levels, said translator comprising:

a switching transistor having its base connected to one end of a first resistor, its collector connected to a supply potential via a second resistor, and its emitter connected to a ground potential;

the other end of said first resistor being connected to receive an ECL signal;

a first diode having its cathode connected to the collector of said switching transistor and its anode connected to the supply potential via a third resistor;

a second diode having its anode connected to the anode of said first diode and its cathode connected to an output node;

a third diode having its cathode connected to the cathode of said first diode and its anode connected to the cathode of said second diode;

clamp delay means interconnected between the collector and the base of said switching transistor for inhibiting the transistor from receiving feedback current to its base so as to cause a faster turn-off, whereby a fast rising edge response is obtained at TTL logic levels during a high-to-low transition of the input logic level signal;

said clamp delay means including a fourth diode, a second transistor, a fourth resistor and a capacitor; and

said fourth diode having its anode connected to the collector of said switching transistor, the collector of said second transistor being connected to the cathode of said fourth diode and to one end of the fourth resistor, the emitter of said second transistor being connected to the base of said switching transistor, the other end of said fourth resistor being connected to one end of the capacitor and to the base of said second transistor, the other end of said capacitor being connected to the ground potential.

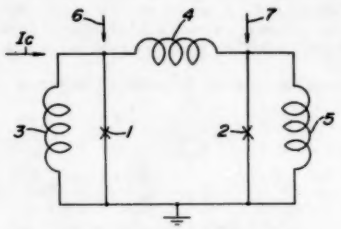
4,678,945

UNIDIRECTIONAL SINGLE-FLUX-QUANTUM LOGIC CIRCUIT

Takuo Sugano; Yoichi Okabe; Hideharu Miyake, all of Tokyo, and Naoki Fukaya, Kawasaki, all of Japan, assignors to University of Tokyo, Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,488
Claims priority, application Japan, Mar. 24, 1984, 59-56549
Int. Cl.[4] H03K *19/195*
U.S. Cl. 307—476 **11 Claims**

1. A method of unidirectionally transmitting signal through a superconducting logic circuit, which logic circuit includes a first one-Josephson-junction SQUID (superconducting quantum interference device), a second one-Josephson-junction SQUID having a critical current of the junction larger than that of the first SQUID, the Josephson junctions of said first and second SQUID's having one side superconductors thereof directly connected to each other, and a superconducting inductor connecting the opposite side superconductors of the Josephson junctions of said first and second SQUID's, inductance of said superconducting inductor being larger than the inductance of said second SQUID; the method comprising



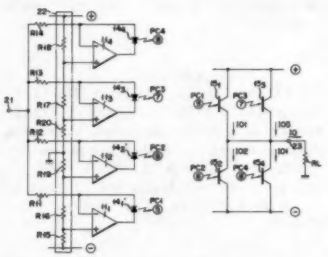
steps of applying a flat bias current to the Josephson junction of the first SQUID while applying a second bias current larger than the first bias current to the second SQUID, and applying an input signal to the first SQUID, whereby the input signal is unidirectionally transmitted to the second SQUID.

4,678,946

CIRCUIT IN WHICH OUTPUT CIRCUIT AND OPERATIONAL AMPLIFIER EQUIPPED INPUT CIRCUIT ARE ELECTRICALLY ISOLATED

Katsumi Nagano, Shimonoseki, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Division of Ser. No. 668,832, Nov. 6, 1984, Pat. No. 4,636,655. This application Jun. 13, 1986, Ser. No. 874,092
Claims priority, application Japan, Nov. 11, 1983, 58-211876; Dec. 27, 1983, 58-246342
Int. Cl.[4] G06G *7/12;* **H03K** *3/42*
U.S. Cl. 307—490 **6 Claims**



1. A function generator having a circuit input terminal and a circuit output terminal comprising:

a plurality of operational amplifiers, each having a first input terminal, a second input terminal, and an output terminal;

a reference voltage generating circuit for applying different reference voltages to said first input terminals of said plurality of amplifiers, individually;

a resistor connected between said second input terminal of each of said plurality of operational amplifiers and said circuit input terminal to which an input voltage is applied;

an electrophoto-converting element connected between said output terminal and said second input terminal of each of said plurality of amplifiers;

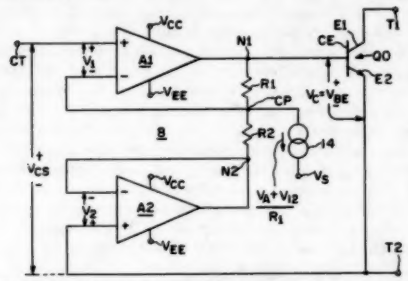
an output circut having a plurality of photoelectric-converting elements, optically coupled with said electrophoto-converting elements, which operate when the corresponding electrophoto-converting elements operate to form a current path between a power source for said output circuit and said circuit output terminal; and

a load element for converting the output current of said plurality pf photoelectric-converting elements into voltage.

4,678,947
SIMULATED TRANSISTOR/DIODE

Johan H. Huijsing, A B Den Hoorn, Netherlands, and Timothy A. Dhuyvetter, San Jose, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Oct. 5, 1984, Ser. No. 658,333
Int. Cl.[4] G06G *7/12*; H03K *3/01, 3/26*
U.S. Cl. 307—490 **17 Claims**



1. A circuit in which current flow between first and second flow terminals thereof is controlled in response to an input voltage between a control terminal thereof and the second terminal, the circuit comprising:

a main transistor having a first flow electrode coupled to the first terminal, a second flow electrode coupled to the second terminal, and a control electrode for regulating current transmission between the flow electrodes;

a first resistor coupled between a control point and a first node which is coupled to the control electrode;

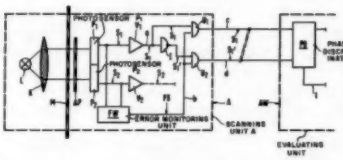
a second resistor coupled between the control point and a second node; and

control means for regulating the voltage at the control point in response to the input voltage and for supplying current to/from the nodes without substantially affecting the currents at the flow terminals, the control means coupled to the nodes, the control point, and the control terminal which are all separate from one another, V_{CS} being approximately V_C/B where V_{CS} is the input voltage, V_C is the voltage between the control and second electrodes and B equals one plus the ratio of the value of the first resistor to the value of the second resistor.

4,678,948
MEASURING DEVICE ERROR MONITORING SYSTEM

Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,508
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323281
Int. Cl.[4] H03K *1/00*; G01B *11/14*
U.S. Cl. 307—511 **6 Claims**



5. In a measuring system for measuring the relative position of two objects, of the type comprising a scale and a scanning unit wherein relative movement of the two objects causes the scanning unit to scan the scale to produce at least one measuring signal indicative of the relative movement of the two objects, the system further comprising an evaluating unit which evaluates the at least one measuring signal, means for detecting errors in the at least one measuring signal, and means for generating an error signal in response to the detected errors, the improvement comprising:

means for generating an inverted signal, opposite in phase to the measuring signal;

a first AND gate having a first input coupled to receive the measuring signal, a second input coupled to receive the error signal, and a first output which carries a gated measuring signal;

a second AND gate having a first input coupled to receive the inverted signal, a second input coupled to receive the error signal, and a first output which carries a gated inverted signal;

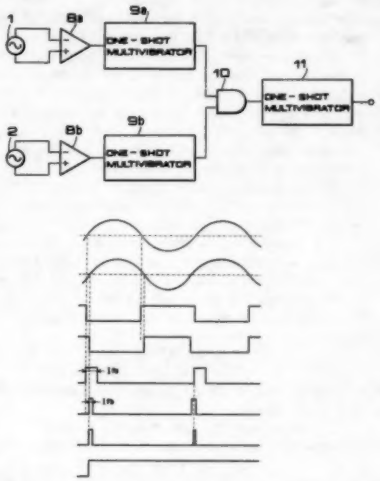
means, included in the evaluating unit and coupled to the first outputs of the first and second AND gates, for generating a first signal when the gated measuring signal is in phase with the gated inverted signal;

said error signal generating means, inverted signal generating means, and first and second AND gates cooperating to insure that the measuring signal and the inverted signal are out of phase when the error signal is absent and are in phase when the error signal is present.

4,678,949
SYNCHRONISM DETECTOR CIRCUIT

Keiichi Oshikiri, and Tooru Nakamura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1985, Ser. No. 760,540
Int. Cl.[4] H03K *5/26*
U.S. Cl. 307—527 **4 Claims**



1. A synchronism detector circuit for indicating a state of synchronism between two a.c. voltages comprising:

first and second comparators for detecting zero cross points of said two a.c. voltages, respectively;

first and second one-shot multivibrators triggered by outputs from said first and second comparators, respectively, for providing pulses having the pulse widths set up in correspondence with the respective synchronous detection allowances;

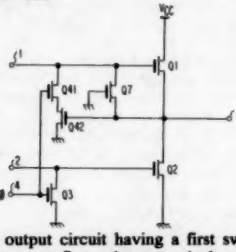
an AND circuit for providing the logical product of the outputs from said one-shot multivibrators; and

a third retriggerable one shot multivibrator triggered by the output from said AND circuit and maintaining an altered state so long as there is relative synchronism between said a.c. voltages as determined by the tolerance allowances of said first and second one-shot multivibrators.

4,678,950
OUTPUT CIRCUIT HAVING AN IMPROVED PROTECTING CIRCUIT

Kenjiro Mitake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,177
Claims priority, application Japan, May 13, 1983, 58-83533
Int. Cl.[4] H03B *1/04*; H03F *21/00*; H01L *29/78*; H02H *3/20*
U.S. Cl. 307—550 **11 Claims**



1. In an output circuit having a first switching transistor coupled between a first voltage terminal and an output terminal, a second switching transistor coupled between said output terminal and a second voltage terminal, first means for supplying a gate of said first transistor with a first data signal, second means for supplying a gate of said second transistor with a second data signal having an opposite phase to said first data signal, and control means responsive to a control signal for clamping the gates of said first and second transistors at a potential that makes said first and second transistors non-conducting, the improvement comprising:

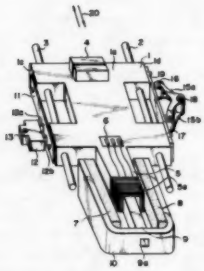
protection means coupled between said gate of said first transistor and said output terminal, said protection means providing a current path between said gate of said first transistor and said output terminal when an abnormal voltage is applied to said output terminal, said protection means comprising a third transistor having a source-drain current path coupled between said gate of said first transistor and said output terminal and having a gate connected to a reference voltage, and

wherein said control means comprises a fourth transistor coupled between the gate of said second transistor and said second voltage terminal and having a gate receiving said control signal, and a series circuit of fifth and sixth transistors coupled between said gate of said first transistor and said second voltage terminal, a gate of said fifth transistor receiving said control signal, a gate of said sixth transistor being coupled to said output terminal.

4,678,951
LINEAR MOTOR

Akira Nikaido, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,822
Claims priority, application Japan, Nov. 29, 1983, 58-224758
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—13 **4 Claims**

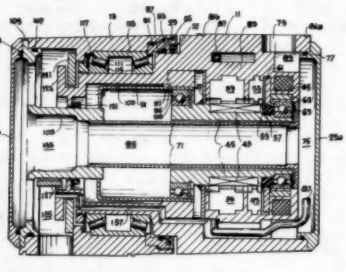


1. A linear motor for driving a carriage used in a magnetic memory, said linear motor comprising a linearly movable member including a coil frame of a hollow sleeve configuration which is formed integrally on the carriage which is movably supported by the frame body of the magnetic memory, said coil frame further being provided at a side opposite to a magnetic head mounting portion of said carriage, and a driving coil wound around said coil frame; stator means on the frame body of said magnetic memory and including a central yoke disposed within said coil frame along the direction of carriage movement, a U-shaped yoke surrounding said driving coil with the opposite legs thereof being parallel to said central yoke, and a pair of permanent magnets; position sensor means including a magnetic scale provided on one side of said carriage in the direction of carriage movement, and a sensor means provided on the frame body of said magnetic memory and having a pair of magnetic reluctance heads located on said sensor means at the side opposed to said magnetic scale; guide means including a guide plate provided on said carriage at an opposite side from said magnetic scale in the direction of carriage movement and biasing means on the frame body of the said magnetic memory for biasing said guide plate in a direction perpencicular to the direction of movement of said carriage.

4,678,952
SEALED JOINT FOR A ROBOT AND THE LIKE

Thomas W. Peterson, Corvallis; David B. Hole, Albany, and S. Stanley Mintz, Corvallis, all of Oreg., assignors to Intelledex Incorporated, Corvallis, Oreg.

Filed Aug. 13, 1985, Ser. No. 765,867
Int. Cl.[4] B25J *1/10*; F16H *1/28*; H02K *5/128*
U.S. Cl. 310—83 **19 Claims**



1. A sealed joint as for a robot comprising,

first and second closed, laterally adjacent sleeves mounted for a rotation about a common axis, the sleeves separated by a rotary seal having two contacting members, one associated with each sleeve, and means for adjustably positioning the seal between the sleeves,

a motor having a rotor and a stator mounted within the first sleeve, the rotor parallel to the axis of the sleeves, the second sleeve having a driven member, the two sleeves having a link member internally joining the rotor and the driven member, whereby the rotor transfers power to the link member so that the first sleeve drives the second sleeve, and means for sealing the two sleeves containing the motor, driven member, and link member assembly, and

a fluid coolant tube extending into a sealable port of the first sleeve and communicating thermally with said motor.

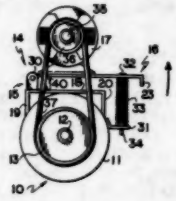
4,678,953
MOTOR MOUNT ASSEMBLY

Raymond A. Johnson, Box 100, Agema, Saskatchewan, Canada S0C 1Y0

Filed May 28, 1986, Ser. No. 867,458
Claims priority, application Canada, Jun. 3, 1985, 483027
Int. Cl.[4] H02K *5/00*
U.S. Cl. 310—91 **12 Claims**

1. A motor mount assembly for driving devices such as grain augers, unloading augers, transfer augers and the like; comprising in combination a base plate secured to the device in opera-

tive position thereon, a motor support plate, means to attach and detach said support plate to said base plate for pivotal movement through an arc, and spring means operatively connected between said support plate and said device for urging said support plate in an arc away from said base plate, said means to attach and detach said support plate to said base plate including a pair of spaced apart mounting means on said base



plate, and a pivot shaft secured across said support plate, said pivot shaft having a portion extending upon each side edge of said support plate, said extending portions pivotally engaging said mounting means, means on said shaft limiting the endwise movement of said shaft and said support plate in one direction, and means on said base plate selectively limiting the movement of said shaft and said support plate in the other direction.

4,678,954

ROTOR WITH PERMANENT MAGNETS HAVING THERMAL EXPANSION GAPS

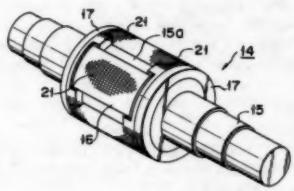
Tamio Takeda, Yokkaichi; Toshio Gokyu, Mie; Yuji Mizutani, Kuwana, and Jun Nakashima, Mie, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 2, 1986, Ser. No. 869,336

Claims priority, application Japan, Mar. 5, 1986, 61-31524[U]; Mar. 5, 1986, 61-31525[U]

Int. Cl.⁴ H02K *21/14, 1/18*

U.S. Cl. 310—156 **10 Claims**



1. A rotor with permanent magnets, said rotor comprising:
(a) a shaft;
(b) a pair of positioning rings axially spaced on the outer peripheral surface of said shaft; and
(c) permanent magnets bonded onto the outer peripheral surface of said shaft between said pair of positioning rings, said permanent magnets being disposed such that gaps are left between said permanent magnets and said positioning rings, said gaps serving to absorb thermal expansion of said permanent magnets and/or said positioning rings.

4,678,955

PIEZOELECTRIC POSITIONING DEVICE

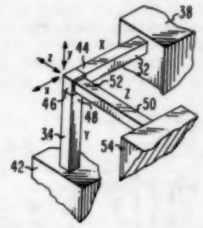
Minoru Toda, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1986, Ser. No. 853,751

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—328 **6 Claims**

1. A relatively stiff piezoelectric positioning device comprising:
a first piezoelectric member having first and second opposing ends wherein, in response to an applied first control signal, one of said ends displaces relative to the other end in a given first direction parallel to an axis through said ends;
a second piezoelectric member having third and fourth opposing ends wherein, in response to an applied second control signal, one of said third and fourth ends displaces relative to the other end in a given second direction parallel to an axis through said third and fourth ends;
a third piezoelectric member having fifth and sixth ends wherein, one of said fifth and sixth ends displaces in a third



direction parallel to an axis through said fifth and sixth ends in response to an applied third control signal;
means fixedly secure an end of each said member to each other at a common junction; and
a support for securing the other ends of said members in fixed spaced relation with said first, second, and third directions normal.

4,678,956

VIBRATION WAVE MOTOR

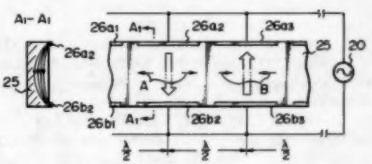
Kazuhiro Izukawa, Yokohama; Takayuki Tsukimoto, Fujisawa, and Ichiro Okumura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,937

Claims priority, application Japan, Feb. 10, 1984, 59-24022

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—323 **4 Claims**



1. A motor comprising:
(a) an electro-mechanical energy converting element for generating a travelling vibration wave;
(b) a pair of electrodes formed on said electro-mechanical energy converting element and extending in a direction parallel with the advancing direction of said travelling vibration wave, said travelling vibration wave being generated by the application of AC voltages which have relatively different phases, to said pair of electrodes; and
(c) a movable element contacting said electro-mechanical energy converting element and driven by said travelling vibration wave.

4,678,957

PIEZOELECTRIC CERAMIC SWITCHING DEVICES AND SYSTEMS AND METHODS OF MAKING THE SAME

John D. Harnden, Jr., Schenectady, and William P. Kornrumpf, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

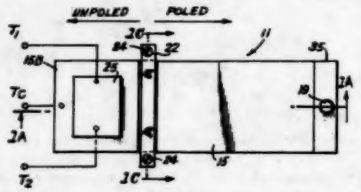
Filed Jun. 24, 1986, Ser. No. 879,495

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—332 **10 Claims**

1. A piezoelectric ceramic switching device including in combination at least one piezoelectric ceramic bender-type switching device having a movable piezoceramic bender member comprised by at least two planar selectively prepoled

piezoelectric plate elements secured in opposed parallel relationship sandwich fashion on opposite sides of at least one central conductive surface and having respective outer conductive surfaces that are insulated from each other and the central conductive surface by the respective intervening piezoelectric plate element thicknesses, said bender-type piezoelectric switching device further including at least one set of coacting electrical switch contacts opened and closed by the prepolarized movable bender member of the piezoelectric ceramic switching device, and clamping means securing a different non-poled portion of the piezoelectric ceramic plate elements adjacent to and mechanically supporting the selectively prepoled movable bender member portion in a cantilever manner for opening and closing the set of coacting electri-



cal contacts, the different non-poled portions of the piezoelectric ceramic plate elements disposed under said clamping means remaining non-movable as being mechanically unstrained and electrically neutral, wherein the unpoled piezoelectric plate element portions extend beyond the clamped portion thereof in a direction opposite from the prepoled movable bender portion and wherein the further unpoled piezoelectric plate element portions between the respective outer conductive surfaces and the central conductive surface form capacitors having any desired capacitance value in the range of tenths of a microfarad and greater dependent upon power rating and usable as circuit components in an electrical circuit for controlling operation of the piezoelectric bender-type switching device or otherwise.

4,678,958

HIGH PRESSURE SODIUM VAPOR LAMP WITH IMPROVED COLOR REPRODUCTION INDEX

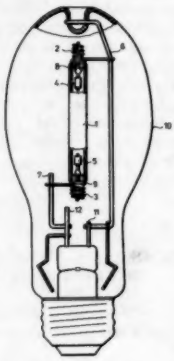
Miklós Csapody, Budapest, Hungary, assignor to Tungsram Rt., Budapest, Hungary

Filed May 23, 1985, Ser. No. 737,260

Claims priority, application Hungary, Jun. 12, 1984, 2256/84

Int. Cl.[4] H01J *1/02*

U.S. Cl. 313—15 **1 Claim**



1. A high pressure sodium vapour lamp with improved color reproduction index, which comprises a ceramic discharge vessel in an outer envelope having at least a pair of electrodes and a filling comprising at least one additive material, such as sodium introduced exclusively in the form of an amalgam, as well as an ignition gas, a pair of conductors for the current supply of the electrodes, characterized in that at both ends of the discharge vessel and externally thereof a heating element is arranged, which during the entire operation of the discharge vessel are connected in series therewith, wherein each heating element is coupled to the electrode at the adjacently lying end of the discharge vessel as well as with one of the current conductors, said heating elements being formed as resistance coils and being arranged on closure elements which are provided for the closing of the discharge vessel, said heating elements incandescing and forming a mixed light lamp with said discharge vessel.

4,678,959

DEVICE FOR COOLING THE PINCH SEAL OF AN ELECTRIC LAMP, AND AN ELECTRIC LAMP AND AN IRRADIATION APPARATUS PROVIDED WITH THIS COOLING DEVICE

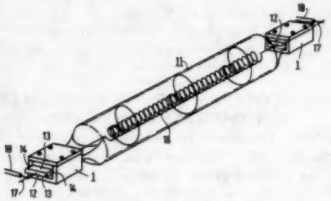
Jan A. C. Mewissen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,676

Claims priority, application Netherlands, Nov. 15, 1984, 8403486

Int. Cl.[4] H01J *7/24, 1/34;* H01K *1/58*

U.S. Cl. 313—17 **21 Claims**



1. A device for cooling a pinch seal of an electric lamp comprising a lamp vessel enclosing an interior space and sealed by a pinch seal, and at least one current supply conductor extending longitudinally through said pinch seal,

said device comprising a metal sleeve arranged for surrounding said pinch seal with a given clearance, along at least a portion of the length thereof, and a compliant thermally conductive mass arranged inside said sleeve for filling the clearance space between said pinch seal and said sleeve, said thermally conductive mass comprising metal fibers.

4,678,960

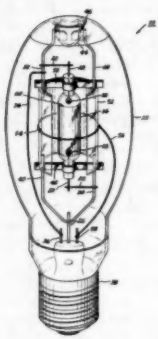
METALLIC HALIDE ELECTRIC DISCHARGE LAMPS

Gilbert H. Reiling, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1985, Ser. No. 761,251

Int. Cl.[4] H01J *61/34, 61/35*

U.S. Cl. 313—25 **10 Claims**



1. A gaseous electric discharge lamp comprising:

an hermetically sealed vitreous light-transmissive outer en-

velope having electrical terminal means sealed thereinto for making electrical connection from an external power source to the interior of said envelope;

a sealed, vitreous arc tube disposed within said outer envelope;

first and second non-liquid metallic arc electrodes disposed within said arc tube and connected to electrical lead means sealed into said arc tube for making electrical connection through respective ends of said arc tube;

a quantity of mercury disposed within said arc tube sufficient upon complete evaporation thereof during operation of said lamp to yield a particle pressure of approximately 101 to 1520 pascals within said arc tube;

an ionizable medium disposed within said arc tube comprising a plurality of metallic halides; each metallic halide including a metal which emits electromagnetic radiation in the visible range of wavelengths in one of a plurality of predetermined multiple narrow emission lines, such that the total radiation emitted appears as white light;

reflector means comprising a reflective coating disposed on the exterior surface of said arc tube to reflect long wavelength ultraviolet radiation and short wavelength infrared radiation having a wavelength of less than 1500 nanometers; and a cylindrical reflector disposed within said outer envelope and surrounding said arc tube and comprising a material which blocks transmission of infrared radiation having a wavelength of at least 1500 nanometers, said reflective coating and said cylindrical reflector cooperating for reflecting infrared and ultraviolet wavelengths inward so that said infrared and ultraviolet wavelengths are substantially removed from the light output of said lamp; and

conductive means for supporting said arc tube within said outer envelope and making electrical connection from said electrical terminal means to said electrical lead means.

4,678,961

PROJECTION TELEVISION DISPLAY TUBE WITH IMPROVED COOLING

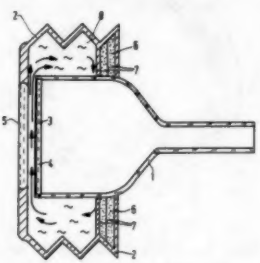
Albert A. Comberg, and Johann Schröder, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1985, Ser. No. 796,350

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1985, 3510021

Int. Cl.[4] H01J *29/86, 7/28*

U.S. Cl. 313—36 **13 Claims**



1. A projection television display tube comprising

an evacuated envelope having a display window with a display screen disposed on its inside,

a transparent second window disposed in front of the outside of said display window to define a space between the display window and the second window,

a transparent coolant flowing through said space,

a cooling member retaining said coolant in a closed cooling system about said evacuated envelope, said cooling member dissipating heat from the display window to the atmosphere, and

a latent heat accumulator in said cooling member, whereby said coolant is in thermally conducting contact with said latent heat accumulator, said latent heat accumulator including a latent heat accumulator agent.

4,678,962

IMAGE PICKUP TUBE

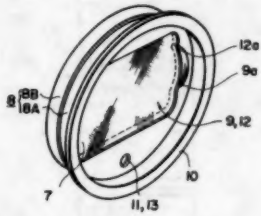
Masatake Hayashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,315

Claims priority, application Japan, Nov. 7, 1984, 59-234599

Int. Cl.[4] H01J *29/08, 31/38*

U.S. Cl. 313—383 **1 Claim**



1. An image pick-up tube, comprising a glass bulb, a face plate, a target surface, a mesh electrode arranged in opposition to the target surface and a mesh holder to support said mesh electrode comprising a pair of elements each having an opening of rectangular form, wherein one pair of diametrically opposing sides constituting said opening in each of said elements is formed with a segmental spherical surface including a portion of said sides, whereby said mesh electrode is curved between said elements such that the tension is non-uniform over said mesh electrode and the tension of said electrode has anisotropy.

4,678,963

SHADOW MASK FOR A COLORED IMAGE TUBE AND IMAGE TUBE COMPRISING THE SAME

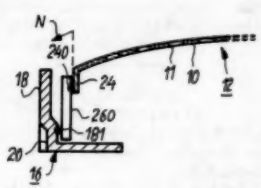
Carlo L. Fonda, Anagni, Italy, assignor to Videocolor, Montrouge, France

Filed Nov. 21, 1984, Ser. No. 673,825

Claims priority, application France, Nov. 25, 1983, 83 18853

Int. Cl.[4] H01J *29/07*

U.S. Cl. 313—405 **7 Claims**



1. A colored image tube comprising:

a glass tube envelope;

a frame attached to an interior surface of the envelope, adjacent to a screen section of the envelope;

a shadow mask having a peripheral edge and made of material similar to that of the frame so that both mask and frame exhibit substantially the same coefficient of thermal expansion;

a plurality of planar bimetallic strips welded at opposite end portions thereof to the frame and the mask edge;

the bimetallic strips exhibiting displacement upon initial operational warm-up of the tube to compensate for greater expansion of the mask relative to the frame during initial tube warm-up.

4,678,964
COLOR DISPLAY TUBE

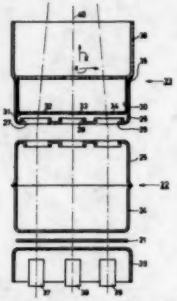
Antonius H. P. M. Peels, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 516,016, Jul. 22, 1983, abandoned. This application Jan. 17, 1986, Ser. No. 821,113

Claims priority, application Netherlands, Aug. 25, 1982, 8203322

Int. Cl.[4] H01J *29/51, 29/62*

U.S. Cl. 313—414 6 Claims



1. In a color display tube comprising an evacuated envelope containing a luminescent screen and an electron gun system for producing a central electron beam and first and second outer electron beams lying in a single plane, said electron gun system including first and second spaced-apart cup-shaped focusing lens electrodes having respective first and second facing bottom plates, each plate including central and first and second outer apertures through which the corresponding electron beams pass, said electrodes cooperating to produce respective central and first and second outer focusing lenses for individually focusing the corresponding electron beams;

the combination with at least one of said electrodes of correction means for correcting astigmatic focusing and misconvergence of the electron beams, said correction means comprising a correction plate disposed within the respective cup-shaped electrode and parallel to its apertured bottom plate, said correction plate including central and first and second outer apertures through which the respective electron beams pass, at least one of said apertures begin elongate and having an individual height and width selected relative to each other to correct for astigmatic focusing of the respective electron beam, said outer apertures being located relative to said central aperture to correct for misconvergence of the electron beams.

4,678,965
ELECTRON TUBE

Michael J. C. van Weert, and Gerardus C. S. W. van Limpt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,885

Claims priority, application Netherlands, Nov. 15, 1984, 8403485

Int. Cl.[4] H01J *29/48*

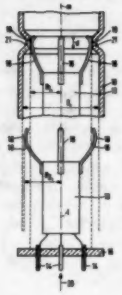
U.S. Cl. 313—451 2 Claims

1. An electron tube including a tubular glass envelope portion having a central axis and an inside diameter D, an electrode system in the envelope portion having a central axis, means for axially positioning the electrode system in the envelope portion, and centering means for positioning the electrode system in the envelope portion such that the electrode system axis substantially coincides with the envelope portion axis;

characterized in that said centering means comprises:

(a) a plurality of predefined contact surfaces in the envelope portion, each disposed at a predetermined axial position and spaced from the envelope portion axis by a distance R_1 which is smaller than D/2; and

(b) a plurality of resilient elements extending from the electrode system and having free ends radially spaced from the electrode system axis by a distance R_2 when the resilient elements are in a relaxed state, where $R_1 < R_2 < D/2$, said resilient elements being positioned and dimensioned



such that their free ends are depressed radially inward by respective ones of the contact surfaces when the electrode system is fully installed in the envelope portion;

said centering means enabling installation of the electrode system without any contact between the centering means and the envelope portion except at the predefined contact surfaces.

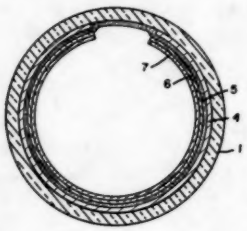
4,678,966
FLUORESCENT LAMP HAVING TWO PHOSPHOR LAYERS

Eric L. Mager, Beverly, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Jun. 13, 1980, Ser. No. 159,025

Int. Cl.[4] H01J *1/62*

U.S. Cl. 313—487 1 Claim

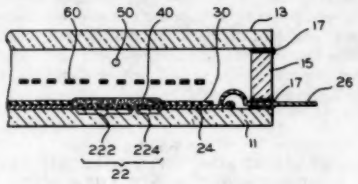


1. A fluorescent lamp comprising a glass envelope having electrodes at its ends and containing a discharge-substaining filling of mercury and inert gas, and two layers of different phosphors on the inner surface of the lamp envelope, the underlying phosphor layer increasing the maintenance of the overlying phosphor to a greater extent than if the underlying layer comprised the same phosphor as that of the overlying layer or if the only phosphor present were that of the overlying layer and in a weight about equal to that of both layers, wherein the overlying phosphor comprises manganese-activated magnesium gallate and the underlying phosphor comprises cerium terbium magnesium aluminate.

4,678,967
FLUORESCENT DISPLAY PANEL

Yoichi Kadota, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,676
Claims priority, application Japan, Mar. 6, 1984, 59-32025[U]
Int. Cl.[4] H01J 63/04
U.S. Cl. 313—497 11 Claims

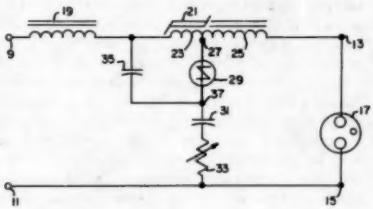


1. A fluorescent display panel comprising: a transparent substrate having an anode segment formed thereon, said anode segment having phosphor provided thereon, said phosphor being excitable to emit light responsive to an electron bombardment thereof, means for forming a vacuum envelope enclosing said anode segment and phosphor, and means positioned above said phosphor for producing said electron bombardment within said envelope, said anode segment having first and second regions adjacent each other to pass predetermined amounts of said light therethrough, said second region of said anode forming a dim shadow image region of said light, said first region of said anode forming a bright main image region of said light, said shadow image and said bright main image forming a combined display pattern of bright and dim light observed through said transparent substrate, said dim shadow image of light being a reduced amount of said light which gives a sense of perspective to said bright light in said display pattern.

4,678,968
HIGH INTENSITY DISCHARGE LAMP STARTING AND OPERATING APPARATUS

James N. Lester, Rockport, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Feb. 15, 1985, Ser. No. 702,107
Int. Cl.[4] H05B 37/00
U.S. Cl. 315—290 23 Claims



1. A high intensity discharge lamp starting and operating apparatus comprising:

a first pair of terminals formed for connection to an AC voltage source;

a second pair of terminals formed for connection to a high intensity discharge lamp;

a series-connected ballast means and step-up transformer coupled to one of said first and one of said second pair of terminals, said step-up transformer having primary and secondary windings with a tap therebetween;

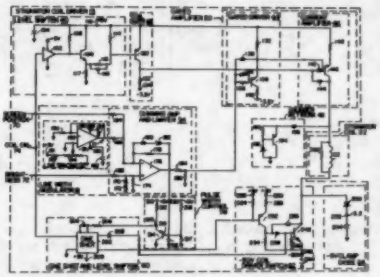
a series-connected bilateral switch and AC impedance coupled to said step-up transformer tap and to the other one of said first and the other one of said second pair of terminals; and

a charge storage means coupled to the junction of said ballast means and step-up transformer and to the junction of said bilateral switch and AC impedance whereby relatively high currents are converted to relatively high voltages and applied to a high intensity discharge lamp, said primary winding of the step-up transformer including a saturable core whereby voltage buildup on said charge storage means is effected.

4,678,969
PSEUDO-RASTER WEATHER DISPLAY APPARATUS

Kurt R. Schwerdt, Bolton, and Gerald B. Levine, Hudson, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 22, 1983, Ser. No. 506,928
Int. Cl.[4] H01J 29/58
U.S. Cl. 315—382 23 Claims



1. A display system comprising:

means for generating lines in a raster pattern with an energy beam on said display system;

means for defocusing said energy beam primarily in a direction normal to a movement of said beam for substantially filling in spaces between said lines in accordance with a control signal.

4,678,970
POWER AS REQUIRED BEAM DEFLECTION SYSTEM FOR CRT DISPLAYS WITH RASTER SUPPLY SWITCHING

Winston W. Goldman, Scottsdale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed May 1, 1986, Ser. No. 858,149
Int. Cl.[4] H01J 29/70, 29/76
U.S. Cl. 315—397 9 Claims

1. An electron beam magnetic deflection system for a cathode ray tube controllably operable to provide linear deflection in a stroke mode for random deflection of the beam and a raster mode for periodic deflection of the beam in a sequential pattern of raster lines, comprising:

input means for receiving an input signal indicative of a desired deflection of the beam and for providing an output signal responsive to said input signal,

output means coupled to receive said output signal for providing a further output signal for controlling current in a deflection coil operatively coupled to said electron beam, and a desired beam deflection in a predetermined direction in accordance with the polarity of said further output signal,

first and second raster mode switches and first and second stroke mode switches,

means for applying stroke voltage sources of a predetermined magnitude and of a first polarity and an opposing polarity to said first and second stroke mode switches respectively in said stroke mode,

means for applying raster voltage sources of a further predetermined magnitude greater than said predetermined magnitude and of a first polarity and an opposing polarity respectively to said first and second raster mode switches in said raster mode,

switch control means responsive to a raster/stroke signal for sequentially commanding said stroke mode or said raster mode of operation and further responsive to said further output signal from said output means for alternately enabling and disabling said first and second raster mode switches in said raster operating mode when generating said raster lines in accordance with the polarity of said further output signal, and for enabling said first and second stroke mode switches in said stroke mode, and

first coupling means for coupling said output means to one of said stroke voltage sources, when one of said first and second raster mode switches is disabled in said raster mode of operation when generating said raster lines.

4,678,971

LINEAR MOTOR AND CONTROL METHOD THEREOF

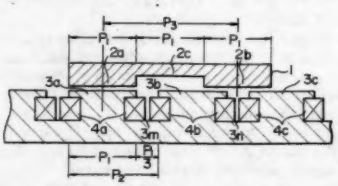
Hiroshi Kanazawa, Hitachi; Seizi Yamashita, Katsuta, and Kunio Miyashita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 10, 1986, Ser. No. 817,623

Claims priority, application Japan, Jan. 14, 1985, 60-3370; Jan. 14, 1985, 60-3371; Jan. 14, 1985, 60-3372

Int. Cl.[4] H02K *41/00*

U.S. Cl. 318—135 **11 Claims**



1. A linear motor comprising:

a first magnetic pole including a plurality of first magnetic pole teeth of magnetic material having protruded and recessed parts extending in a longitudinal direction, each first magnetic pole tooth having a predetermined longitudinal length; and

a second magnetic pole including a yoke, a plurality of second magnetic pole teeth of magnetic material having protruded and recessed parts, a coil assembly having a plurality of coils, a respective coil being wound on a respective one of said second magnetic pole teeth, and permanent magnets, said yoke and said second magnetic pole teeth being opposed to said first magnetic pole teeth with slight gaps, a relative position of said first and said second magnetic pole teeth in a longitudinal direction being changeable, a longitudinal length of said protruded and recessed parts of said first magnetic pole and said protruded parts of said second magnetic pole being substantially equal to each other, a longitudinal length of said recessed parts of said second magnetic pole being substantially one-third of the longitudinal length of said protruded parts of said first magnetic pole, and a number of said protruded parts of said first magnetic pole being a multiple of two.

4,678,972

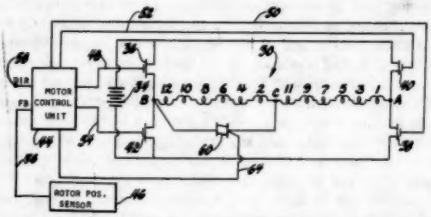
SELF-STARTING SINGLE-PHASE BRUSHLESS DC MOTOR AND CONTROL THEREFOR

Richard N. Lehnhoff, Kettering, and Jack W. Savage, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1986, Ser. No. 908,730

Int. Cl.[4] H02P *1/22*

U.S. Cl. 318—254 **3 Claims**



1. A self-starting brushless DC motor with symmetrical stator and rotor air gap geometry and control arrangement therefor, comprising in combination:

a permanent magnet rotor, a multi-pole stator having a single-phase full winding disposed thereon, such full winding comprising two serially connected sections relatively displaced on the stator such that energization of the full winding defines a run mode magnetic field pole substantially midway between similar field poles of adjacent winding sections, a controlled switch element connected across one of the serially connected stator winding sections and selectively actuable to short circuit such section, and a controller effective to energize the full winding with a source of direct current in accordance with the rotary position of the rotor to produce torque for turning the rotor in a desired direction, the controller being further effective when energizing the winding to initiate rotation of the rotor to momentarily actuate said controlled switch element if the rotor is in a null position for which such energization fails to produce sufficient torque for turning the rotor, thereby to momentarily shift the magnetic field pole in proportion to the relative displacement of the stator winding sections, and provide increased torque for successfully initiating turning of the rotor.

4,678,973

SENSORLESS STARTING CONTROL FOR A BRUSHLESS DC MOTOR

James O. Elliott, Beavercreek, and Michael B. Monahan, West Carrolton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1986, Ser. No. 916,369

Int. Cl.[4] H02P *6/02*

U.S. Cl. 318—254 **2 Claims**

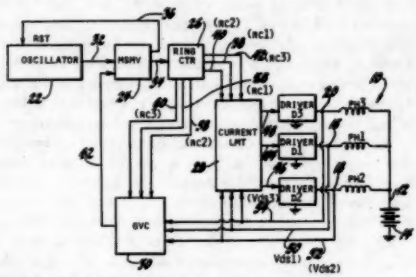
1. For a brushless DC motor having a permanent magnet

rotor, and three phase stator windings energizable to develop a magnetic field for producing torque for rotating the rotor, a controller for energizing the phase windings with a source of direct current for initiating the rotation of the rotor in a desired direction without the use of rotor position sensors, such controller comprising:

counter means defining a phase winding energization sequence corresponding to the sequence of generated voltages which occurs in said phase windings when the rotor is turning in the desired direction, such counter means being effective when clocked to deenergize the currently energized phase winding and energize the next winding of the energization sequence;

synchronous acceleration means effective if at the initiation of the current winding energization, the generated voltage in the next winding of the energization sequence is less than the generated voltage in the previous winding of the energization sequence, thereby indicating that the rotor is turning in the desired direction, for permitting the energization to continue, and thereafter for clocking the counter means in relation to the point at which the generated voltage in such next winding of the sequence becomes greater than the generated voltage in such previous winding of the sequence, whereby such energization produces positive synchronous torque if the rotor is turning in the desired direction; and

synchronous deceleration means effective if at the initiation of the current winding energization, the generated voltage in the next winding of the energization sequence is already



greater than the generated voltage in the previous winding of the energization sequence, thereby indicating that the rotor is turning in the wrong direction and that such energization is producing positive torque for accelerating the rotor in the wrong direction, for clocking the counter means substantially without delay, whereby if the rotor is turning in the wrong direction, the production of positive torque is interrupted, and the energization sequence is effectively reversed to produce synchronous negative torque by energizing the next winding of the sequence.

2. For a brushless DC motor having a permanent magnet rotor, and three phase stator windings energizable to develop a magnetic field for producing torque for rotating the rotor, a method of energizing the phase windings with a source of direct current for initiating the rotation of the rotor in a desired direction without the use of rotor position sensors, such method comprising the steps of:

defining a phase winding energization sequence corresponding to the sequence of generated voltages which occurs in said phase windings when the rotor is turning in the desired direction;

initially energizing a given one of said phase windings without knowledge of the rotor position or direction of rotation, and comparing the generated voltages thereby produced in the two deenergized phase windings;

continuing the energization of said given phase winding until a time determined in relation to the point at which the generated voltage in the next winding of the energization sequence becomes greater than the generated voltage in the previous winding of the energization sequence, if upon energization of the given phase winding, the generated voltage in such next winding is less than the generated voltage in such previous winding, thereby indicating that the rotor is turning in the desired direction, whereby the energization of said given winding produces synchronous positive torque for accelerating the rotor if such energization causes the rotor to turn in the desired direction; and

interrupting the energization of said given phase winding substantially without delay and energizing the next winding of the energization sequence, if upon energization of the given phase winding, the generated voltage in the next winding of the energization sequence is already greater than the generated voltage in the previous winding of the energization sequence, thereby indicating that the rotor is turning in the wrong direction and that the energization of the given winding is producing positive torque for accelerating the rotor in the wrong direction, whereby the defined energization sequence is effectively reversed to produce synchronous negative torque for decelerating the rotor if the energization of the given winding causes the rotor to turn in the wrong direction.

4,678,974

PULSATING CURRENT ELECTROMOTOR WITHOUT COMMUTATOR

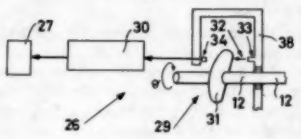
Fausto Guastadini, Frazione Tuffo Centro, 6, 14023 Cocconato (AT), Italy

Continuation of Ser. No. 668,166, Nov. 1, 1984, abandoned. This application May 14, 1986, Ser. No. 865,902

Claims priority, application Italy, Nov. 7, 1983, 68156 A/83

Int. Cl.[4] H02K *29/10*

U.S. Cl. 318—254 **3 Claims**



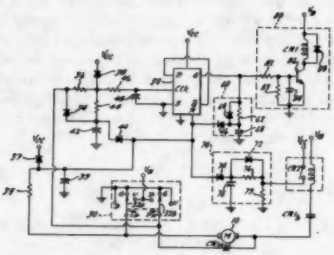
1. A pulsating current brushless electric motor comprising: a rotor fixed to a rotating shaft, said rotor comprising magnetic poles diametrically opposed to one another relative to the shaft and extending over the greater part of the circumference of said shaft, the poles having an opposite polarity with respect to one another; a stator formed by a substantially cylindrical hollow body within which the rotor is arranged, the stator comprising stator slots uniformly spaced about the inner circumference of said stator, distinct stator multiple layer windings contained within said slots, each distinct stator winding following the internal perimeter of said stator slots so as substantially to cover the internal surface of the stator, and which, at the outlet from each slot, are traversed by current always in the same direction; detector means comprising an opaque member fixed to said shaft, said member having an arcuate extent equal to 360° divided by said number of windings, said member cooperating with photodiodes, one photodiode being associated with each of said multiple layer windings, such that said opaque member alternately interrupts and restores a beam of light transmitted by each of said photodiode, said photodiode further being uniformly distributed about the circumference of the shaft; electronic means controlling power distribution to the stator windings, said electronic means being responsive to the angular displacement of the rotor as communicated by the interruption of the photodiode beam corresponding to its associated stator winding; and a power source from which the motor components receive their power.

4,678,975

MOTOR CONTROL CIRCUIT FOR MOTOR DRIVEN POWER WINDOWS

Robert J. Vrabel, Sterling Heights; Jeffery L. Vajgart, Dearborn; Lawrence E. Staszel, Dearborn Heights; Henry J. Ewald, Livonia; Norman M. Haygood, Jr., Canton, and Leon M. Misewicz, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 6, 1986, Ser. No. 816,659
Int. Cl.[4] H02P *1/22, 3/08*
U.S. Cl. 318—266 9 Claims



7. A one-touch down control circuit for controlling the electrical energization of a window drive motor in an automotive vehicle comprising:

a manually actuated switch means defining an unactuated "OFF" position and separately actuated "UP" and "DOWN" positions;

means connected between said switch means and said motor for automatically energizing said motor to drive said window in its downward direction when and after said switch means is actuated to its "DOWN" position for a time period that does not exceed a first predetermined period of time and for deenergizing said automatically energized motor after said switch means is subsequently actuated and returned to its "OFF" position; and

means connected to said energizing means for sensing current levels in said motor and to cause said energizing means to deenergize said automatically energized motor when said current level in said motor exceeds a predetermined level for a second predetermined period of time.

9. A motor control circuit for energizing a reversible D.C. motor comprising:

a source of D.C. energy;

switching means being manually actuable to control the direction of rotation of said motor through the application of D.C. energy from said source to selected terminals of said motor;

circuit means connected to said switching means, said source and said motor for responsively applying energy from said source to said motor when said switching means is actuated to control the rotation of said motor in a first predetermined direction and the duration of actuation is less than a first predetermined period of time and continuing said application for a second period of time that extends past said first predetermined period of time;

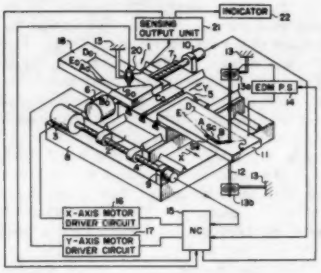
said circuit means also being responsive to subsequent actuation and release of said switching means during said second period of time to deenergize said motor and responsive to the actuation of said switching means for a duration longer than said first predetermined period of time to apply energy from said source to said motor only for said longer duration.

4,678,976

PATH-CONTROLLED MACHINING METHOD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Inc., Kanagawa, Japan

Continuation-in-part of Ser. No. 646,623, Aug. 31, 1984, Pat. No. 4,605,886. This application Mar. 13, 1986, Ser. No. 839,792
Claims priority, application Japan, Sep. 2, 1983, 58-160419; Sep. 16, 1983, 58-169395
Int. Cl.[4] G05B *19/36*
U.S. Cl. 318—577 6 Claims



1. A method of machining a workpiece to generate a desired contour therein by means of a numerically path-controlled machine tool having first support means for supporting an electrically conductive workpiece, tool-support means supported by second support means for positioning a tool member in machining relationship with said workpiece in a machining operation and drive means drivingly coupled with at least one of said first and second support means and operable in response to a predetermined sequential set of numerical commands for relatively displacing the first and second support means to correspondingly relatively displace said tool member and said workpiece along a prescribed machining feed path as to generate a desired machined contour in said workpiece during said machining operation, said method comprising the steps of:

in a preliminary operation in advance of said machining operation, furnishing said drive means with said predetermined sequential set of numerical commands whereby the consequent relative displacement between said first and said second support means results in the generation of output signals representing the actual relative movements of a tool member and a workpiece respectively affixable to said second and first support means;

recording said output signals and generating with the thus-recorded output signals a visible trace upon an electronic display screen;

in said machining operation, disposing and maintaining sensing means in a fixed positional relationship with one of said support means and in sensing relationship with a given point fixedly related to the other of said support means so that said sensing means outputs a position signal monitoring the actual contour formed by said tool means in said workpiece during said machining operation;

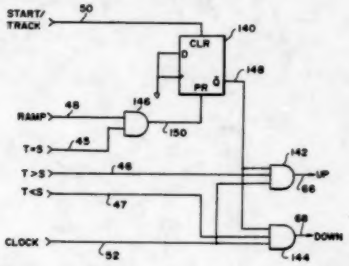
displaying a visible trace representing said position signal progressively with advance of said machining contour on said screen in superimposition at least in part with the first-mentioned trace as said drive means relatively displaces said first and second support means in said machining operation by said predetermined sequential set of numerical commands, the coincidence of said traces representing proper progress of the machining operation; and

terminating the machining operation upon deviation of the visible trace on said screeen representing said position signal from the first-mentioned trace by more than a predetermined degree.

4,678,977
SETPOINT CONTROLLER

Harry H. Burlingame, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 15, 1985, Ser. No. 787,519
Int. Cl.[4] G05B *19/28*
U.S. Cl. 318—601 **15 Claims**

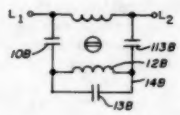


1. A setpoint controller, comprising:
target means operative to store a digital target value;
control means for enabling an operator of the setpoint controller to control the target value;
setpoint means operative to store a digital setpoint value; and
comparison means operative when the setpoint value is not equal to the target value for causing the setpoint value to change at a selected rate toward the target value.

4,678,978
QUIETING CIRCUITS FOR PERMANENT MAGNET SYNCHRONOUS MOTORS

Harold W. Curtis, Stoughton, Mass., assignor to Brookfield Engineering Laboratories, Inc., Stoughton, Mass.

Continuation of Ser. No. 537,099, Sep. 29, 1983, abandoned, which is a continuation of Ser. No. 241,399, Mar. 6, 1981, abandoned. This application Jul. 12, 1985, Ser. No. 754,334
Int. Cl.[4] H02K *19/02*
U.S. Cl. 318—690 **10 Claims**



1. A quieting circuit with a permanent magnet, fully synchronous absolute speed electric motor, the circuit including a first lead provided with a coil between first and second lines, a parallel lead between the first and second lines provided with a phase shifting capacitor and a phase shifted coil, and a lead in parallel with the phase shifted coil between the phase shifting capacitor and the second line and including means to bypass a minor percentage of the total watts motor input, said means including at least one capacitor.

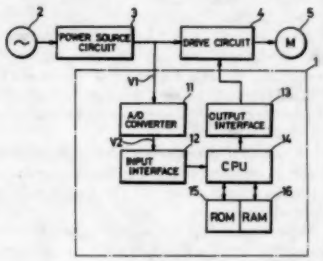
4,678,979
APPARATUS FOR CONTROLLING THE CARRIAGE OF A PRINTER

Masaaki Hori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 3, 1986, Ser. No. 881,613
Claims priority, application Japan, Jul. 4, 1985, 60-147372
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **3 Claims**

1. An apparatus for controlling the carriage of a printer with a stepping motor, for reciprocating the carriage having a printing head mounted thereon, comprising a power source circuit, a drive circuit for driving said stepping motor with electric power supplied from said power source circuit, and a controller which controls said drive circuit;

wherein said controller is provided with voltage detecting means for detecting the magnitude of the voltage supplied

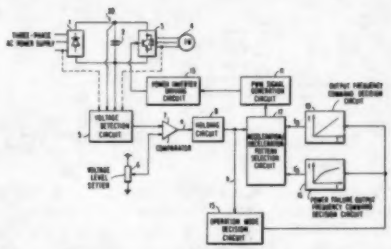


from said power source circuit, and delay control means for delaying the initiating of the drive of said stepping motor at each end of the reciprocating motion of said carriage according to said magnitude of detected voltage supplied from said voltage detecting means.

4,678,980
POWER FAILURE STOP CIRCUIT FOR A CONVERTER

Shigeyuki Sugimoto; Masayuki Kato, and Katsuhiko Chonan, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,543
Claims priority, application Japan, Oct. 31, 1985, 60-244613
Int. Cl.[4] H02P *3/18*
U.S. Cl. 318—759 **5 Claims**



1. A power failure stop circuit for a converter (**20**) including a power rectifier unit (**1**) and a power inverter unit (**3**), comprising:
(a) a voltage detection circuit (**5**) for detecting an operating voltage in said converter;
(b) a voltage level setter (**6**) for establishing a reference voltage signal;
(c) a comparator (**7**) for comparing the reference voltage signal with the converter operating voltage, and for outputting a power failure signal when said operating voltage becomes lower than said reference voltage;
(d) an operation mode decision circuit (**15**) for comparing a target speed command (f_i) with an output frequency command (f_o) to determine a normal operating mode for said converter and for outputting an overriding deceleration mode signal irrespective of the normal operating mode at the time of a power failure;
(e) an output frequency command decision circuit (**10**) for generating a first frequency command in accordance with said normal operating mode determination;
(f) a power failure output frequency command decision

circuit (16) for generating a second frequency command in accordance with an internally stored deceleration pattern established exclusively for power failures in response to an overriding deceleration mode signal from the operation mode decision circuit;

(g) an acceleration/deceleration pattern selection circuit (17) for selecting the first frequency command from the output frequency command decision circuit when no power failure signal is present, and the second frequency command from the power failure output frequency command decision circuit when a power failure signal is present;

(h) a PWM signal generation circuit (11) responsive to a frequency command selected by the acceleration/deceleration pattern selection circuit for generating a converter control signal; and

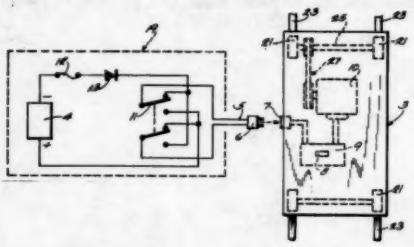
(i) a driving circuit (13) for switching power inverter unit elements to control a motor speed in accordance with the control signal from the PWM signal generation circuit such that a deceleration mode is automatically implemented in the event of a power failure to regeneratively brake the motor.

4,678,981

PORTABLE POWER SOURCE FOR MOBILE STORAGE CARRIAGE

William P. Murray, Ft. Atkinson, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Aug. 1, 1986, Ser. No. 891,617
Int. Cl.[4] A43B *53/00, 87/00*
U.S. Cl. 320—2 **7 Claims**



1. In combination with a mobile storage system having at least one carriage mounted for movement along rails; motor means for powering the carriage along the rails; and circuit means for controlling the motor means, apparatus for providing electrical power to the carriage comprising:

a. a portable source of electrical power comprising:

i. at least one electric battery;

ii. switch means in series with the battery for controlling the polarity of the electric current from the battery;

iii. a hand held casing enclosing the battery and switch means; and

iv. connector means extending from the casing for distributing the electric power from the switch means;

b. an electrical receptacle mounted to the carriage, the receptacle being adapted to receive the connector means of the portable power source, the receptacle being electrically connected to the circuit means for controlling the motor means and connected to the motor means; and

c. an electrical switch in series with the circuit means for controlling the motor means and a associated with the receptacle, the switch being operable to open when the connector means is inserted into the receptacle to thereby open the circuit means for controlling the motor means,

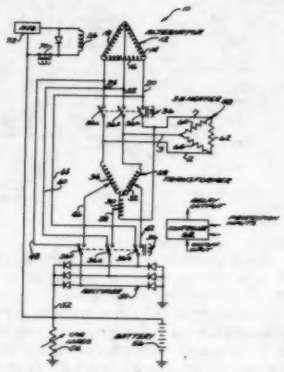
so that the portable source of power provides electric power to the motor means for moving the carriage in selected directions along the rails.

4,678,982

SUPPLEMENTAL AUTOMOTIVE VEHICULAR HEATER SYSTEM AND METHOD OF PROVIDING SAME

Stephen B. Offiler, 222A Park St., Attleboro, Mass. 02703; Peter G. Berg, 60 Towne St., and Keith W. Kawate, 12 Virginia St., both of Attleboro Falls, Mass. 02763

Filed Apr. 16, 1986, Ser. No. 852,484
Int. Cl.[4] H02J *7/14;* **B60L** *1/02*
U.S. Cl. 322—8 **14 Claims**



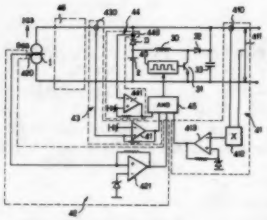
1. An automotive vehicle having an engine and a plurality of electrical loads, an alternator having a field winding driven by the engine to provide electrical power for such loads, a voltge regulator for controlling the field winding energization, a battery for supplementing the electrical power provided by the alternator when needed and for turning over the engine upon start up, the alternator having a stator with three windings, the windings coupled together to provide a three phase output on three output lines, the output lines connected to a rectifier which in turn is connected to a circuit including the plurality of electrical loads and the battery, the voltage regulator controlling the level of energization of the alternator field in order to provide a selected voltage level in the circuit characterized in that transformer means are coupled between the three windings and the rectifier and an electrical resistor heater is coupled to the output lines intermediate the windings and the transformer means.

4,678,983

DC POWER SUPPLY WITH ADJUSTABLE OPERATING POINT

Christian Rouzies, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Jan. 24, 1986, Ser. No. 822,215
Claims priority, application France, Jan. 25, 1985, 85 01062
Int. Cl.[4] G05F *5/00*
U.S. Cl. 323—222 **13 Claims**



1. A DC power supply having an adjustable current/voltage

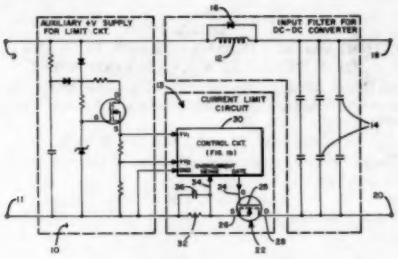
(I/V) operating point comprising a source of electrical energy, of a current generator type connected in parallel with a buffer storage assembly comprising a constant voltage element connected in series with a one-way conductor said power supply being intended to power a useful load assembly having a hyperbolic power consumption characteristic of a rectangular hyperbola type ($I=P/V$, where P is its power consumption), and said source of electrical energy having an output characteristic of current as a function of voltage I(V) having two points of intersection with said hyperbolic power consumption characteristic, and voltage-raising means having an output connected in parallel with said useful load, and capable of temporarily raising the power supply voltage fed to said load.

4,678,984

DIGITAL POWER CONVERTER INPUT CURRENT CONTROL CIRCUIT

Christopher P. Henze, Eagan, Minn., assignor to Sperry Corporation, Blue Bell, Pa.

Filed Apr. 21, 1986, Ser. No. 854,243
Int. Cl.[4] G05F 1/44
U.S. Cl. 323—285 **4 Claims**



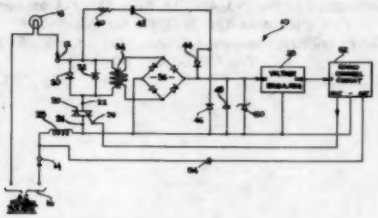
1. An input current control having a normal operating range, coupled between an input power supply means connectable to a source of electrical power and output means connectable to a load, comprising current limit means comprising control means, current regulating means having a control terminal and a current path coupled between said input power supply means and said output means which may be selectively opened and closed in response to a control signal applied to said control terminal wherein said control signal determines whether said current path is opened or closed, and said control signal controls the magnitude of current flowing in said current path when said path is closed, inrush/normal, operation circuit means coupled to said input power supply means constructed to supply said control signal to said control terminal so as to cause said regulating means to close said current path between said input power supply means and said output means when said control signal reaches a predefined threshold magnitude, and so as to cause said regulating means to control the current flowing in said current path during normal operation of said input current control circuit, current sensing means for sensing the current flowing through said current path and signal-control means coupled to said current sensing means and to said control terminal for assuming control of said current regulating means in response to said current sensing means such that said current path will be opened upon the sensing by said current sensing means of a current flowing through said current path which is greater than a predefined overcurrent magnitude.

4,678,985

TWO-TERMINAL LINE-POWERED CONTROL CIRCUIT

Jeffrey M. Moskin, Los Angeles, Calif., assignor to Novitas, Inc., Santa Monica, Calif.

Filed Oct. 31, 1986, Ser. No. 925,607
Int. Cl.[4] G05F 3/02
U.S. Cl. 323—324 **5 Claims**



1. A control circuit comprising in combination:
bidirectional switch means having first and second main terminals and a control terminal used for triggering the switch means into conduction;
bidirectional voltage regulator means for maintaining a relatively constant voltage drop across said means over a wide range of current passing through said means in either direction;
means for connecting the bidirectional switch means in series with the bidirectional voltage regulator means to form a first series circuit whereby a bidirectional current path is established through the first series circuit when the switch means is triggered into conduction;
first and second circuit terminals;
means for connecting the circuit terminals to a load circuit which includes a load connected in series with an AC power source;
means for connecting the first series circuit to the circuit terminals, whereby when the bidirectional current path is established, the load is energized by the power source;
transformer means having a primary and a secondary winding;
first rectifier means;
means for connecting the primary winding of the transformer in parallel with the bidirectional voltage regulator means;
means for connecting the first rectifier means to the transformer secondary winding to rectify the voltage appearing across said winding, said rectified voltage appearing at a first pair of rectified voltage terminals when the switch means is conducting;
second rectifier means;
current limiter means;
means for connecting the current limiter means and the second rectifier means to the two circuit terminals to provide a current limited and rectified voltage to a second pair of rectified voltage terminals in response to the voltage appearing across the circuit terminals when the switch means is not conducting;
means for connecting the first pair of rectified voltage terminals in parallel with the second pair of rectified voltage terminals;
energy storage means;
means for connecting the energy storage means to the first pair of rectified voltage terminals to filter the rectified voltage appearing thereacross;
controller means for providing a control signal;
means for connecting the controller means to the control terminal of the switch means whereby the control signal acts to trigger the switch means into conduction; and
means for connecting the controller means to the energy

storage means, whereby the controller means derives its operating power from the filtered rectified voltage.

4,678,986

ELECTRIC TRANSFORMER WITH SELECTIVELY ENERGIZED MODULAR CIRCUITS

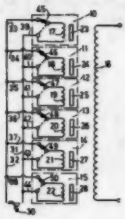
Louis Barthelemy, Résidence Longchamp, 78770 Thoiry, France

Continuation of Ser. No. 497,013, May 23, 1983, abandoned. This application Apr. 24, 1986, Ser. No. 856,449

Claims priority, application France, May 25, 1982, 82 08998

Int. Cl.[4] G05F *3/00*

U.S. Cl. 323—343 **7 Claims**



1. An electric transformer for supplying an adjustable electric output magnitude, including several modules having therebetween a binary progression relationship with respect to their power handling capability and being associated with respective switching means for selectively rendering them operative or inoperative, each module having at least one primary circuit input coil, said primary circuit input coils being connected through said switching means in parallel to a common AC voltage supply source, the primary coils of each of said modules cooperating with one single secondary circuit output coil which is common to all of said modules, through respective seperate magnetic circuits, said switching means being so connected as to neutralize the effect of the electric induction of the respective primary coils on said common secondary output coil, while maintaining the magnetic activity of said magnetic circuits.

4,678,987

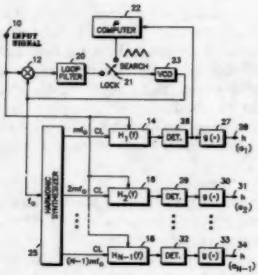
FEATURE EXTRACTOR FOR QUASI-PERIODIC SIGNALS

Jerald L. Bauck, Urbana, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 7, 1985, Ser. No. 784,970

Int. Cl.[4] G01R *23/16*

U.S. Cl. 324—77 R **8 Claims**



1. A feature extractor comprising:

a feature extractor signal input adapted to have a quasi-periodic signal applied thereto, said quasi-periodic signal including a fundamental frequency and harmonics thereof;

fundamental frequency generating means connected to said feature extractor signal input for receiving a quasi-periodic signal applied thereto and generating a fundamental frequency signal therefrom;

harmonic synthesizer means connected to said fundamental frequency generating means for receiving the generated fundamental frequency signal and providing at separate outputs the fundamental frequency signal and harmonic frequency signals equal in frequency to the harmonics of the quasi-periodic signal; and

a plurality of clocked bandpass filters each having a signal input, a signal output and a clock input, the signal inputs of said first and second filters being connected to said feature extractor signal input, the clock input of said first filter being connected to the fundamental frequency signal output of said harmonic synthesizer means, the clock inputs of said remaining filters being connected to the corresponding harmonic frequency signal outputs of said harmonic synthesizer means, and the signal outputs of said filters providing indications of the amount of fundamental frequency and harmonic, respectively, in the received quasi-periodic signal.

4,678,988

METHOD AND APPARATUS FOR SPECTRAL ANALYSIS OF A SIGNAL AT A MEASURING POINT

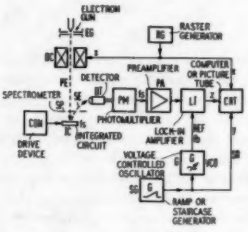
Hans-Detlef Brust, Dudweiler, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,104

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420269

Int. Cl.[4] G01R *31/28*

U.S. Cl. 324—158 R **13 Claims**



1. A method for detecting and imaging a measuring point of a specimen which carries a voltage of at least one frequency, with the assistance of a microscope, comprising the steps of:

radiating the measuring point with a primary beam to cause emission of secondary radiation representing the voltage at the measuring point;

detecting and converting the secondary radiation into a signal representing the voltage at the measuring point;

applying a reference signal to a variable-frequency filter to define the center frequency of the filter;

filtering the detected and converted signal with the variable-frequency filter to produce a measuring signal dependent on the center frequency of the filter;

applying a reference signal to a recording device to define the center frequency; and

applying the measuring signal to and recording the measuring signal with the recording device.

4,678,989

OPTICAL ABSORPTION SPECTROSCOPY FOR SEMICONDUCTORS

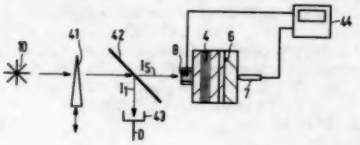
Peter Blood, Dorking, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1985, Ser. No. 713,525

Claims priority, application United Kingdom, Apr. 23, 1984, 8407621

Int. Cl.⁴ G01R *31/26, 15/12*

U.S. Cl. 324—158 D **26 Claims**



13. An apparatus for spectroscopically analyzing optical absorption in a semiconductor sample comprising

a substrate, a first cladding layer on said substrate, a semiconductor sample layer on said first cladding layer, and a second cladding layer on said sample layer, said first and second cladding layers having a larger band gap than said sample layer, wherein said sample layer and said first and second cladding layers are all of one conductivity type, and said substrate is of an opposite conductivity type, and wherein a p-n junction between said substrate and said first cladding layer is sensitive to optical radiation of a wavelength above absorption edges of said first and second cladding layers,

first electrode means for contacting said substrate,

second electrode means transparent to optical radiation for contacting said second cladding layer,

radiation means for directing monochromatic optical radiation to said sample layer through said transparent second electrode means, and

first means for deriving a signal from said first and second electrode means, said signal being related to a voltage generated across said p-n junction by a photovoltaic effect, and said signal indicating absorption in said semiconductor sample layer of said optical radiation.

4,678,990

MOTOR MONITOR SIGNAL ANALYSIS SYSTEM

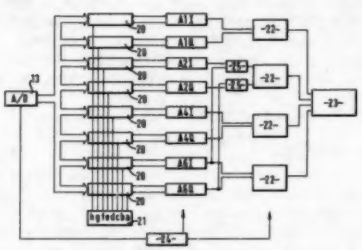
John Bicknell, Rudgwick, and Stephen O'Brien, Horsham, both of England, assignors to Bonar Bray Limited, Hertfordshire, England

Filed Nov. 5, 1985, Ser. No. 795,197

Claims priority, application United Kingdom, Nov. 8, 1984, 8428199

Int. Cl.⁴ G01R *31/12, 23/16, 23/00*

U.S. Cl. 324—158 MG **10 Claims**



1. A magnetic field motor monitor for monitoring a motor driven by a line supply having a line frequency, said monitor having a signal analysis system comprising means for taking instantaneous samples of the motor magnetic field at accurately determined and equally spaced times synchronized with the line frequency driving the motor, a plurality of separate memories, means for adding the current instantaneous sample value to or subtracting it from the contents of each separate memory, addition or subtraction taking place in dependence on which of the samples is being processed, and each said addition or subtraction for the sample being processed being performed before the occurrence of the next sample, means coupled to the memories for providing from the contents of the memories signals indicative of respective amplitudes of a number of harmonically related frequency components of the motor magnetic field and register means for holding a status word which determines whether the next sample is to be added to or subtracted from each seperate memory.

4,678,991

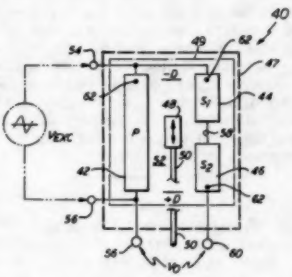
INDUCTIVE DISPLACEMENT TRANSDUCER WITH UNIPOLAR OUTPUT

Samuel Schmidt, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 18, 1985, Ser. No. 799,534

Int. Cl.⁴ G08C *19/08;* **G01B** *7/14*

U.S. Cl. 324—207 **8 Claims**



1. Apparatus for providing a signal indication of the position of the shaft of a controlled displacement device, within a range of displacement, in a system having a source of alternating current (AC) voltage excitation signals, comprising:

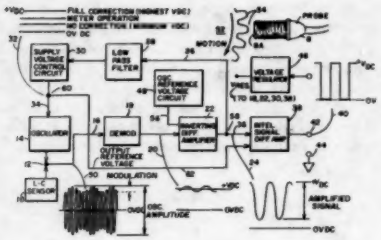
a housing; and

an inductive displacement transducer enclosed within said housing and having a bobbin assembly with a central air gap, a movable magnetic core having a shaft extending through said housing and adapted for movement through said air gap in response to movement of said shaft, a primary winding disposed on said bobbin and connected through first and second transducer terminals to the source of AC voltage excitation signals, and two series opposed secondary windings disposed on said bobbin and connected between said first terminal and a third transducer terminal, in series with said primary winding, for providing oppositely phased secondary voltage signals by transformation of the primary winding AC voltage excitation signal at said first and second terminals, said secondary voltage signals varying oppositely in amplitude between minimum and maximum values in response to displacement of said core through said air gap, to provide the sum magnitude of said primary winding signal and said series opposed secondary signals, as a unipolar signal indication of core position over the range of displacement, at said second and third terminals.

4,678,992
ELECTRONIC METAL DETECTOR

Allen W. Hametta, Arlington Heights, Ill., assignor to Hi-Tech Systems, Corp., Carol Stream, Ill.

Filed Jul. 12, 1983, Ser. No. 513,103
Int. Cl.[4] G01B *7/14;* **G08B** *21/00;* **G01F** *15/06*
U.S. Cl. 324—208 **12 Claims**



1. In an electronic metal detector for sensing both magnetic and non-magnetic metals in motion having an oscillator including a sensing coil whose Q varies when metal targets are brought within the magnetic field generated by said coil, said Q variations creating a change in the amplitude of the oscillations produced by the oscillator, the improvement comprising:

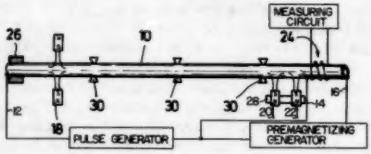
an intelligence circuit means connected to said oscillator for generating a usable intelligence signal comprised of a DC voltage level and an AC voltage component representative of the movement of metal targets past said coil; and

means connected to said intelligence circuit means and receiving said intelligence signal for generating a feedback DC supply voltage without the AC voltage component of the intelligence signal to operate said oscillator in a manner to maintain a predetermined and constant amplitude of oscillation throughout the sensing range of the coil whether the metal targets are stationary or moving at various speeds.

4,678,993
DISTANCE MEASURING DEVICE OPERATING WITH TORSIONAL ULTRASONIC WAVES DETECTED WITHOUT MODE CONVERSION

Antonius Vinnemann, Stuttgart, and Veit Köninger, Neuhausen, both of Fed. Rep. of Germany, assignors to Gebhard Balluff GmbH & Co., Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,473
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343310
Int. Cl.[4] G01B *7/14;* **H03H** *9/00;* **H04B** *11/00*
U.S. Cl. 324—208 **16 Claims**

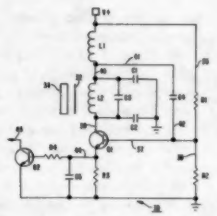


1. An ultrasonic distance measuring device for linear distance measurement comprising a tube of magnetostrictive material, a magnet displaceable relative to the tube for generating torsional ultrasonic pulses as a function of electrical pulses applied to the tube by a pulse generator and travelling along the tube, said torsional ultrasonic pulses serving as position signals, and also comprising an ultrasonic receiver coupled to the tube for converting ultrasonic pulses generated in the tube into electrical signals and a measuring circuit coupled to said ultrasonic receiver for ascertaining the position of the movable magnet as a function of the time interval between the electrical signals obtained from the position signals and at least one respective reference signal generated by the presence of said electrical pulses wherein the ultrasonic receiver for direct detection of torsional pulses is provided as a section of the tube (**10**) which is circumferentially magnetized on the basis of remanence by premagnetizing means and a coil (**24**) surrounding said section in axial direction.

4,678,994
METHODS AND APPARATUS EMPLOYING APPARENT RESONANT PROPERTIES OF THIN CONDUCTING MATERIALS

Ronald C. Davies, Cwmbran, United Kingdom, assignor to Digital Products Corporation, Fort Lauderdale, Fla.

Filed Jun. 27, 1984, Ser. No. 625,081
Int. Cl.[4] G01N *27/72;* **G01R** *33/12*
U.S. Cl. 324—236 **62 Claims**



1. Apparatus for detecting electrically conductive material comprising:

a thin layer of conductive material capable of exhibiting spontaneous resonance wherein spontaneous resonance is defined as a characteristic enabling said thin layer to emulate a passive resonant circuit and absorb energy from an appropriately tuned oscillating circuit, said thin layer of conductive material defining a first surface and having a thickness which is less than the skin effect depth of said layer at a predetermined frequency; and

oscillator means having a resonant tank circuit including capacitor means and coil means, said coil means having a plurality of turns defining a second surface substantially parallel to said first surface, said oscillator means having a frequency in relation to the thickness of said thin layer causing a marked reduction in the amplitude of oscillations of said oscillator means when said thin layer of conductive material is placed proximate to said coil in the absence of other conductive material.

4,678,995
APPARATUS AND METHOD FOR DETERMINING THE PRESENCE OF SUBSTANCES IN A SAMPLE BY NMR AND PRODUCING AN NMR IMAGE THEREOF

Malcolm J. Avison; Hoby P. Hetherington, both of New Haven; Thomas H. Jue, Branford, and Douglas L. Rothman, New Haven, all of Conn., assignors to Yale University, New Haven, Conn.

Filed Dec. 12, 1984, Ser. No. 680,866
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **56 Claims**

46. Apparatus for obtaining the spatial distribution of specific substances in a sample by NMR, comprising:

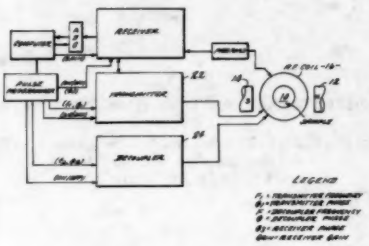
means for applying a static magnetic field to said sample;

means for repetitively applying a first frequency selective RF pulse or pulse sequence to said sample;

means for repetitively applying a second frequency selective RF pulse or pulse sequence to said sample to produce a spin echo;

means for selectively applying a third frequency selective RF pulse or pulse sequence to said sample;

means for applying pulsed magnetic field gradients to said sample during a time when no RF pulse or pulse sequences are being applied, for phase or frequency encoding spatial distribution information about said substance in said sample;



means for acquiring first NMR signals from said sample when said third pulse or pulse sequence is applied, and second NMR signals from said sample when said third pulse sequence is not applied; and

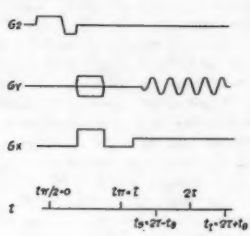
means for differencing said first and said second NMR signals and producing a differenced NMR signal.

4,678,996

MAGNETIC RESONANCE IMAGING METHOD

E. Mark Haacke, University Heights, and Francis H. Bearden, Twinsburg, both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed May 7, 1985, Ser. No. 731,509
Int. Cl.[4] G01V *33/20*
U.S. Cl. 324—309 **30 Claims**



30. A method for scanning a subject comprising the steps of:

(a) creating a relatively uniform magnetic field over a region of interest;

(b) exciting magnetic resonance at least within the region of interest;

(c) monitoring signals generated within the region in response to the resonance excitation;

(d) during the monitoring step, nonuniform frequency encoding said region of interest in a data space representation of the region;

(e) reorganizing the monitored signals to a predetermined format;

(f) filtering reorganized signals to compensate for nonuniform encoding in data space due to the frequency encoding; and,

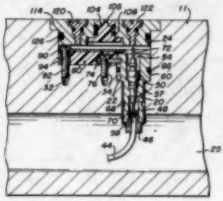
(g) creating an image representation depicting structure in the region of interest.

4,678,997

METHOD AND APPARATUS FOR DIELECTRIC WELL LOGGING OF SUBSURFACE EARTH FORMATIONS WITH A LUMPED CONSTANT ANTENNA

Thomas A. Janes, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 20, 1984, Ser. No. 642,294
Int. Cl.[4] G01V *3/12*
U.S. Cl. 324—341 **25 Claims**



1. A well logging tool for use in obtaining an indicator of the dielectric constant of subsurface earth formations traversed by a borehole, comprising:

an antenna housing means defining an X axis extending longitudinally along said housing means for contacting the wall of said borehole;

a first and a second transmitter antenna means carried by said housing means and spatially distributed along a line parallel to said X axis and adjacent respective ends of said housing means for transmitting electromagnetic energy of a preselected frequency into said formation; and

a first and a second receiver antenna means carried by said housing means and spatially distributed adjacent each other along said line and intermediate of said first and second transmitter antenna means for receiving electromagnetic energy from said formation each said antenna means comprising:

an outer aperture defined by said housing;

a feed-through terminal having an electrical contact extending into said outer aperture;

a filler plug within said aperture;

an antenna slot element disposed on said housing and defining with said outer aperture an electrically resonant cavity, said slot element further defining an elongate slot therein extending in a direction perpendicular to said axis;

an antenna insulator plug sealingly and slidably disposed within said slot;

an elongate inductor carried on said filler plug adjacent said slot in said antenna slot element and in electrical contact with said housing at one end of said inductor; and

a lumped constant resonating means interconnected between said terminal contact and the other end of said inductor forming an electrically resonating circuit with said inductor, said aperture and said slot.

4,678,998

BATTERY CONDITION MONITOR AND MONITORING METHOD

Kunihiro Muramatsu, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 9, 1985, Ser. No. 806,772
Claims priority, application Japan, Jan. 25, 1985, 60-11891
Int. Cl.[4] G01N *27/46*
U.S. Cl. 324—427 **7 Claims**

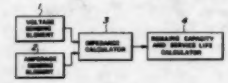
4. A method for monitoring the condition of a storage battery into and out of which currents flow, said currents having components of different frequencies, comprising the steps of:

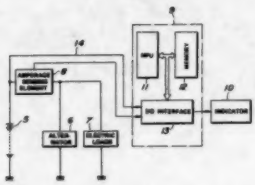
detecting a terminal voltage of the storage battery;

detecting an amperage of the currents;

extracting frequency components the detected terminal voltage and amperage signals at predetermined frequencies;

computing internal impedances of the storage battery at said predetermined frequencies from the voltage and amperage frequency components; and





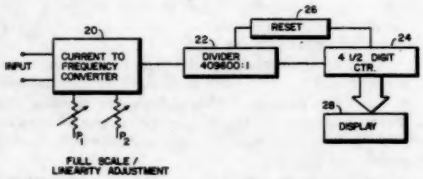
determining the remaining capacity and remaining service life of the storage battery at said predetermined frequencies derived from the computed internal impedances, said determining step being carried out in accordance with predetermined relationships between the internal impedance, remaining capacity and remaining service life of the storage battery for each of said frequencies.

4,678,999

CHARGE DEPLETION METER

Josef F. Schneider, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 27, 1984, Ser. No. 675,174
Int. Cl.[4] G01N *27/46*
U.S. Cl. 324—427 **6 Claims**



1. A charge depletion meter apparatus comprising in combination:

a sensing means connected to a battery source to sense the amount of charge flowing therethrough, said sensing means providing a charge signal,

a current to frequency converter means coupled to said sensing means to receive said charge signal therefrom, said current to frequency converter means converting said charge signal to a digital signal which is representative thereof,

a divider means coupled to said current to frequency converter means to receive said digital signal therefrom, said divider means dividing said digital signal by a predetermined number, said divider means providing an output pulse signal,

a decimal counter means coupled to said divider means to receive said output pulse signal, said decimal counter means accumulating said output pulse signal,

reset means coupled respectively to said divider means and said decimal counter means for manually resetting both to zero, and,

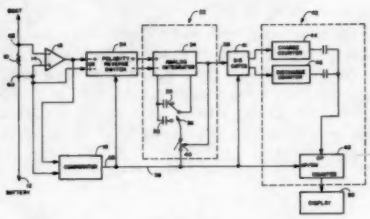
a display means coupled to said decimal counter means to receive said output pulse signal therefrom, said display means displaying said output pulse signal.

4,679,000

BIDIRECTIONAL CURRENT TIME INTEGRATION DEVICE

Robert Clark, 1341 Rosecrans St., San Diego, Calif. 92106

Filed Jun. 20, 1985, Ser. No. 746,751
Int. Cl.[4] H02J *7/00*; G01R *11/00*
U.S. Cl. 324—428 **9 Claims**



1. A bidirectional current-time integration device for use in a circuit in which current direction changes repeatedly, the device comprising:

current sensor means connected in series with a circuit in which the current direction changes repeatedly, for producing a source signal proportional to the current through the circuit which changes polarity when the current changes direction;

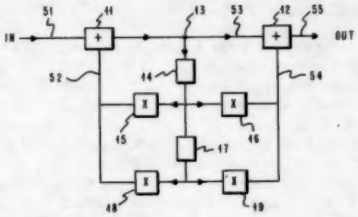
integrator means which includes an amplifier responsive to said source signal for producing a stream of output pulses at a rate dependent on the magnitude of current through the current sensor means, each pulse representing the accumulation of a given unit of integrated current-time;

bidirectional counter means including a first storage means for accumulating said source signal with time when said current is in one direction and a second storage means for accumulating said source signal when said current is in the opposite direction, said first and second storage means comprise a pair of integration capacitors, and integrator switch means for selectively switching from one storage means to the other storage means each time the current changes direction, said integrator switch means comprises a switch responsive to said current direction for selectively connecting one of said capacitors across said amplifier and disconnecting the other capacitor each time the current changes direction, such that any partial charge on the disconnected capacitor is stored, one of said capacitors being connected across said amplifier when the current is in one direction and the other capacitor being connected across the amplifier when the current is in the opposite direction, said amplifier having inputs from connection to said source signal, polarity reversing switch means being connected across said input and responsive to changes in current direction to reverse the polarity of said amplifier inputs, said first and second storage means storing any partial unit of integrated current-time present on said storage means when disconnected until the next current direction change.

4,679,001
ADAPTIVE STOP-NOTCH FILTER

Lynn P. West, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,912
Int. Cl.[4] H03B 1/04
U.S. Cl. 328—167 7 Claims



1. A filter for suppressing energy at time varying frequencies, comprising:

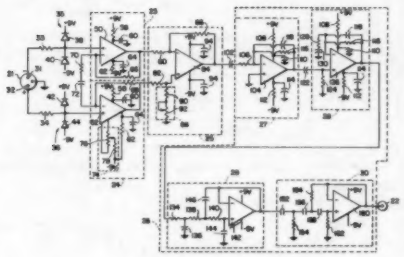
at least two multiplier sections the first of said two multipliers sections being connected in a feedback path between the output and an input of a first adder and the second being connected between a delayed output of said just adder and said input thereof; and,

means for dynamically varying said at least two multiplier sections for operation between at least two time varying frequencies, whereby said filter dynamically supresses energy at said at least two time varying frequencies.

4,679,002
ELECTROMAGNETICALLY SHIELDED NARROW BAND ELECTROENCEPHALOGRAPHIC AMPLIFIER

Gary W. Sherwin, South Huntingdon Township, Westmoreland County, and John M. Zomp, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,056
Int. Cl.[4] H03F 1/00; A61B 5/04
U.S. Cl. 330—66 10 Claims



1. An amplifier receiving first and second input signals indicating electrical potential of skin at two locations, said amplifier comprising:

first and second impedance means, operatively connectable to receive the first and second input signals, respectively, for providing a constant impedance to the first and second input signals and for outputting first and second internal signals, respectively, the constant impedance provided by each of said first and second impedance means being substantially equal;

differential amplifier means for subtracting the first internal signal from the second internal signal to produce a third internal signal;

filter means for filtering and amplifying the third internal signal to produce a narrow band output signal;

internal power source means for providing power to said first and second impedance means, said differential amplifier means and said filter means; and

shield means for completely surrounding and electromagnetically shielding said first and second impedance means, said differential amplifier means, said filter means and said internal power source means from external electrical and magnetic signals, said shield means commprising:

a metal enclosure completely surrounding said first and second impedance means, said differential amplifier means and said filter means; and

a ground plane circuit board, enclosed by said metal enclosure, for mounting said first and second impedance means, said differential amplifier means and said filter means thereon;

an input jack, having an electromagnetic shield case mounted on said metal enclosure, operatively connectable to receive the first and second input signals;

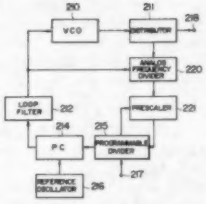
first and second clipping means, mounted on said ground plane circuit board, surrounded by said metal enclosure and operatively connected to said first and second impedance means, respectively, and to said input jack, for clipping the first and second input signals, respectively, at predetermined voltage levels; and

electromagnetically shielded output means for penetrating said metal enclosure to provide egress for the narrow band output signal.

4,679,003
FREQUENCY DIVIDER CIRCUIT AND FREQUENCY SYNTHESIZER USING THE SAME

Morikazu Sagawa, Hachioji; Yoshikazu Mori; Motoi Ohba, both of Kawasaki; Mitsuo Makimoto, Yokohama, and Sadahiko Yamashita, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 709,288, Mar. 7, 1985. This application Sep. 9, 1986, Ser. No. 905,262
Claims priority, application Japan, Mar. 9, 1984, 58-45802; Mar. 9, 1984, 59-45803; Jul. 27, 1984, 59-157827
Int. Cl.[4] H03L 7/04
U.S. Cl. 331—1 A 14 Claims



1. A frequency synthesizer comprising:

a voltage-controlled oscillator oscillating at a frequency corresponding to an input voltage;

a first analog frequency divider for frequency dividing an output of said oscillator;

a second frequency divider for frequency dividing an output of said first frequency divider;

a phase comparator for comparing an output of said second frequency divider with an output of a reference oscillator and for generating an output proportional to a phase difference between the output of said second frequency divider and the output of said reference oscillator; and

a loop filter for eliminating an AC component from the output of said phase comparator, an output of said loop filter being applied to said voltage-controlled oscillator and to said analog frequency divider.

4,679,004

FREQUENCY SYNTHESIZER OF A PHASE-LOCKED TYPE WITH A SAMPLING CIRCUIT

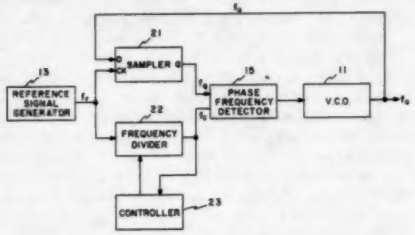
Atsushi Takahara; Tomoyoshi Ishikawa; Hiroyuki Tanaka, and Tamio Okui, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Sep. 2, 1986, Ser. No. 903,212

Claims priority, application Japan, Sep. 3, 1985, 60-194093; Sep. 1, 1986, 61-205464

Int. Cl.⁴ H03L *7/18*

U.S. Cl. 331—14 **7 Claims**



1. A frequency synthesizer of a phase-locked loop type for synthesizing an output oscillation signal having a desired frequency from a reference signal having a constant reference frequency, said frequency synthesizer comprising:

oscillation generating means controlled by a control signal for generating, as said output oscillation signal, a controlled oscillation signal of a frequency dependent on said control signal;

preference signal generating means for generating said reference signal;

sampling means for sampling said controlled oscillation signal by said reference signal to produce a sampled signal;

frequency divider means for frequency dividing said reference signal by a first division factor to produce a first divided signal;

control means for controlling said frequency divider means to adjust said first division factor to a value determined by said desired frequency and said reference frequency; and

detecting means for detecting a phase difference between said sampled signal and said first divided signal to produce a D.C. voltage signal dependent on said difference, said D.C. voltage signal being negatively fed back, as said control signal, to said oscillation generating means.

4,679,005

PHASE LOCKED LOOP WITH FREQUENCY OFFSET

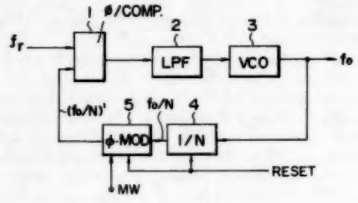
Mitsushige Tatami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 17, 1986, Ser. No. 819,850

Claims priority, application Japan, Jan. 23, 1985, 60/009263; Feb. 13, 1985, 60/009267

Int. Cl.⁴ H03L *7/18*

U.S. Cl. 331—16 **7 Claims**



1. In a phase-locked loop for generating an output signal whose phase is locked onto that of a reference signal and the frequency of which is equal to an offset added to an integral multiple of the frequency of the reference signal, said phase-locked loop comprising:

a variable frequency oscillator for generating said output signal in response to a control signal controlling the frequency of said output signal;

a frequency divider having a changeable dividing ratio and being supplied with said output signal for frequency dividing the output signal;

a resettable shift control signal generator for generating a shift control signal;

a phase modulator supplied with the output of said frequency divider and said shift control signal for shifting the phase of the output of said frequency divider by an amount which is increased with time until said shift control signal generator is reset;

a phase comparator supplied with the reference signal and the output of said phase modulator and comparing the same for generating, as a result of such comparison, said control signal supplied to said variable frequency oscillator; and

means for changing the dividing ratio of said frequency divider and resetting said shift control signal generator at intervals determined by said offset.

4,679,006

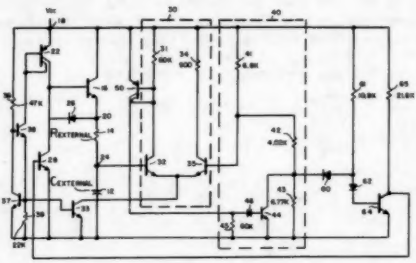
50% DUTY CYCLE RELAXATION OSCILLATOR WITH LATCH-UP PREVENTION CIRCUIT

James P. Skoutas, North Kingstown, R.I., assignor to Cherry Semiconductor Corporation, Greenwich, R.I.

Filed May 14, 1986, Ser. No. 863,123

Int. Cl.⁴ H03K *3/282, 3/295*

U.S. Cl. 331—111 **13 Claims**



1. An oscillator circuit for charging and discharging a timing capacitor comprising;

a source voltage terminal;

a charging transistor having a collector connected to said source voltage terminal and an emitter connected to a first terminal;

discharging diode means having an anode and a cathode, the anode being connected to said first terminal,

a discharging transistor having a collector, a base and an emitter, the collector connected to the cathode of said discharging diode means and the emitter of said discharging transistor connected to ground;

limit setting means for setting an upper voltage limit and a lower voltage limit;

comparator means connected between a second terminal and said limit setting means for comparing the voltage at the second terminal with the voltage limit set by said limit setting means, said timing capacitor being connected to said second terminal;

limit switching means for causing said limit setting means to change the limit it has set in response to an indication from

said comparator means that the present voltage limit has been reached at said second terminal;

means for switching said discharging transistor on or off; and

means for delaying the switching of said discharging transistor in response to a change in the limit set by said limit setting means, such that said discharging transistor switches on or off after said limit setting means has changed the limit.

4,679,007

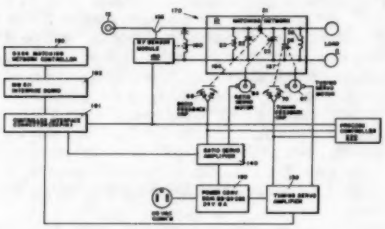
MATCHING CIRCUIT FOR DELIVERING RADIO FREQUENCY ELECTROMAGNETIC ENERGY TO A VARIABLE IMPEDANCE LOAD

George Reese, Wyoming, Mich.; Richard Spielmaker, and Douglas Schatz, both of Ft. Collins, Colo., assignors to Advanced Energy, Inc., Ft. Collins, Colo.

Filed May 20, 1985, Ser. No. 736,215

Int. Cl.[4] H03H *7/40*

U.S. Cl. 333—17 M **17 Claims**



1. A matching circuit for delivering radio frequency electromagnetic energy to a discharge process comprising:

a variable impedance load;

a radio frequency power supply for applying radio frequency power to said load; and

a matching network for coupling and impedance matching said power supply to said load said matching network comprising:

(i) a ratio control means for directly establishing a voltage ratio between said power supply and said load, said ratio control means comprising:

a first ratio inductance electrically connected parallel to said load;

a first variable ratio capacitance electrically connected in series with said load;

a second variable ratio capacitance electrically connected parallel to said load;

a third variable ratio capacitance electrically connected parallel to said load; and

(ii) a tuning control means for directly tuning out a complex portion of the reactance of said load, said tuning control means comprising:

a variable tuning capacitance electrically connected parallel to said load; and

a tuning inductance electrically connected parallel to said load.

4,679,008

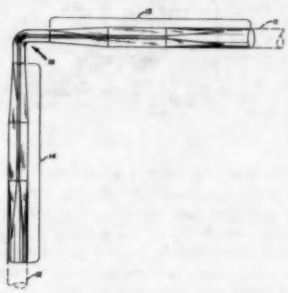
SHARP MODE-TRANSDUCER BEND FOR OVERMODED WAVEGUIDE

Edward P. Irzinski, Gaithersburg; Jerry A. Krill, Ellicott City, and William H. Zinger, Columbia, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Dec. 27, 1984, Ser. No. 686,782

Int. Cl.[4] H01P *1/02, 1/16*

U.S. Cl. 333—21 R **8 Claims**



1. A mode-transducing bend structure comprising,

a first transducer means for converting a first waveguide supporting a circular TE_{01} mode into a first multiport waveguide supporting the rectangular TE_{10} mode,

a second transducer means for converting a second multiport waveguide supporting the rectangular TE_{10} mode back into a second waveguide supporting a circular TE_{01} mode,

said first and second multiport waveguide each having an equal plurality of rectangular TE_{10} mode supporting waveguides whose extending ends terminate in a common plane perpendicular thereto and are arranged along a line adjacent to and in substantial alignment with one another within said common plane, with certain of said rectangular waveguides supporting an E-field parallel to said line and others of said rectangular waveguides supporting an E-field transverse to said line, and

rectangular TE_{10} mode supporting waveguide bend means configured at a predetermined bend angle for interconnecting the first and second multiport waveguide of said first and second transducer means respectively,

said rectangular TE_{10} mode supporting waveguide bend means including an equal plurality of bent rectangular TE_{10} mode supporting waveguides with opposite ends connecting respectively the extending ends of the rectangular TE_{10} mode supporting waveguides of said first and second multiport waveguide about said predetermined bend angle while maintaining said substantial alignment, certain of said bent rectangular waveguides being H-plane bends for supporting said parallel E-field and others of said bent rectangular waveguides being E-plane bends for supporting said transverse E-field.

4,679,009

POLARIZED SIGNAL RECEIVING APPARATUS

Donald C. Cloutier, Exeter, N.H., assignor to M/A-COM, Inc., Burlington, Mass.

Continuation of Ser. No. 644,513, Aug. 27, 1984, Pat. No. 4,574,258. This application Feb. 27, 1986, Ser. No. 833,960

The portion of the term of this patent subsequent to Apr. 3, 2003, has been disclaimed.

Int. Cl.[4] H01P *1/161;* **H01Q** *3/02*

U.S. Cl. 333—21 A **18 Claims**

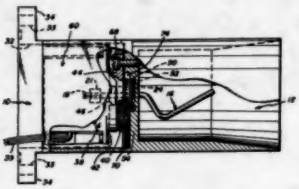
1. A polarized signal receiving apparatus comprising;

a first means including means for transmitting polarized signals,

a second means including means for receiving polarized signals at one end thereof,

means for securing the first means to the second means,

an antenna means having integrally formed portions including a receiver probe portion associated with the second



means, for receiving one polarization of the incident signal, a launch probe portion associated with the first means for launching said signal therein, and a drive portion intermediate the receiver and launch probe portions, said drive portion including a mechanical driven means,

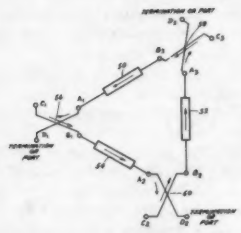
and a drive source comprising a drive means adapted to intercouple with the driven means for driving the antenna means.

4,679,010

MICROWAVE CIRCULATOR COMPRISING A PLURALITY OF DIRECTIONAL COUPLERS CONNECTED TOGETHER BY ISOLATION AMPLIFIERS

Inder J. Bahl, Roanoke, Va., assignor to ITT Gallium Arsenide Technology Center, a division of ITT Corporation, Roanoke, Va.

Filed Dec. 20, 1985, Ser. No. 811,923
Int. Cl.[4] H03H *7/52, 11/02*
U.S. Cl. 333—109 **3 Claims**



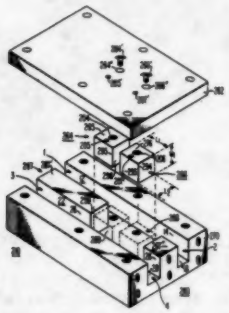
1. A circulator comprising at least three hybrid directional couplers, each of said hybrid directional couplers having four ports, one of said ports receiving a microwave signal which is transmitted to a diagonally opposite second port, the third port receiving a fixed fraction of the power and the fourth port receiving effectually no power, at least three isolator means, each of said isolator means connecting said second port of one of said at least three hybrid directional couplers to said third port of another of said at least three hybrid directional couplers so that each directional coupler is connected to another via an isolator means to form a circulator having at least three arms, each of said isolator means being configured to transmit a microwave signal from said second port of one of said hybrid directional couplers to said third port of said another of said hybrid directional couplers and imposing a substantial insertion loss in any reflected signals transmitting in a direction opposite thereto.

4,679,011

WAVEGUIDE DIRECTIONAL COUPLER FAMILY WITH A COMMON HOUSING HAVING DIFFERENT SETS OF CONDUCTIVE BLOCK INSERTABLE THEREIN

Krishna Praba, and Charles E. Profera, Jr., both of Camden County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 21, 1986, Ser. No. 842,773
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—111 **2 Claims**



2. A waveguide branch directional coupler arangement having coupling value selectable amoung a plurality of values, comprising:

a conductive housing defining the walls of first and second eleongated mutually parallel waveguides defining parallel axes, and a chamber extending between said first and second waveguides, each of said first and second waveguides having a cross section in the form of a rectangle having a width and a height, said cross sections of said first and second waveguides having the same width, said chamber having a width equal to said width of said cross sections of said first and second waveguides, said chamber including first and second walls which are perpendicular to the walls of said first and second waveguides, the length of said chamber in a direction parallel to said axes being fixed;

at least two separate sets of conductive blocks, each said set including at least one conductive block, all blocks of each said set being in the form of rectangular parallelelepipeds, each said set of conductive blocks including fastening means for fastening the blocks of that set at predetermined positions within said chamber to define at least two branch waveguides extending orthogonally between said first and second waveguides to define one coupling value of said plurality of coupling values, whereby one said set of conductive blocks is used at any one time within said conductive housing to define a coupling value, and the remainder of said sets of conductive blocks are not used within said housing at said time but another set can be substituted for said one set to define another coupling value.

4,679,012

MAGNETOSTATIC-WAVE DEVICE

Daniel C. Buck, Anne Arundel, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 31, 1986, Ser. No. 845,919
Int. Cl.[4] H01P *1/20, 9/00, 1/218*
U.S. Cl. 333—161 **22 Claims**

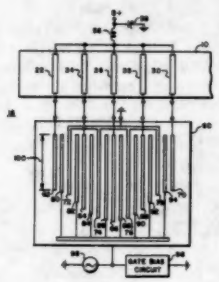
1. A magnetostatic-wave device for propogating at least one microwave signal between input and output terminals, said device comprising:

a ferrimagnetic material through which said microwave signal travels from an input end to an output end;

means for applying a magnetic field to said ferrimagnetic material between said input and said output ends;

an output transducer located at said output end of said ferrimagnetic material, said output transducer transferring said microwave signal in said ferrimagnetic material to said output terminal;

an input conductive layer located at said input end of said ferrimagnetic material, said conductive layer having a plurality of separate finger structures extending across



said ferrimagnetic material in a direction perpendicular to the direction of travel of said microwave signal; and

an active transistor controlled exciting means for separately controlling the amplitude and phase of the input microwave signal applied to each separate finger of said separate finger structures extending across said ferrimagnetic material.

4,679,013

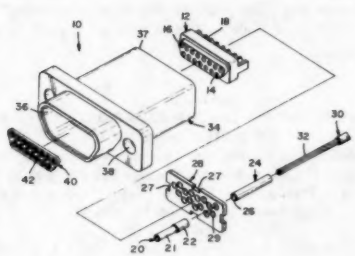
FILTERED ELECTRICAL CONNECTOR

John C. Farrar, Harrisburg; Reuben E. Ney, Mount Joy, and James L. Schroeder, III, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1985, Ser. No. 811,605

Int. Cl.[4] H03H *7/01;* **H01R** *13/66*

U.S. Cl. 333—182 **20 Claims**



7. A filtered electrical assembly comprising:

a dielectric housing means having a plurality of terminal receiving passageways extending therethrough;

electrical terminal means disposed in said terminal receiving passageways, said terminal means being terminated onto insulated electrical conductor means;

filter means disposed on and electrically coupled to exposed conductive portions of said conductor means; and

grounding means electrically coupled to said filter means.

4,679,014

FILTER FUNCTIONING WITH ACOUSTIC WAVES

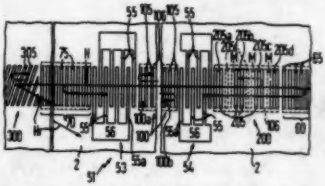
Wolf-Eckhart Bulst, Vaterstetten; Mira Erthel, and Peter Zibis, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 16, 1986, Ser. No. 819,304

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501977

Int. Cl.[4] H03H *9/145, 9/25, 9/64;* **H01L** *41/04*

U.S. Cl. 333—195 **12 Claims**



1. An electric acoustic wave filter, comprising:

a digital structure comprising a plurality of strip-shaped coatings on a surface of a substrate;

said digital structure being situated along a running direction of propagated waves in the filter;

the digital structure being one of the elements selected from the group consisting of a transducer or resonator structure;

a group of additional strip-shaped coatings similar to the strip-shaped coatings of the digital structure, said group being arranged directly adjacent an end of the digital structure and also along said running direction of said propagated waves in the filter;

said group of additional coatings being dimensioned and arranged such that it functions in a reflection-free manner so as not to affect normal operation of the filter; and

said group of additional coatings being dimensioned and positioned with respect to the end of the digital structure such that during manufacture of the digital structure through an exposure technique, coatings of the digital structure at the end adjacent the group of additional coatings are exposed to substantially a same degree as more centrally located fingers of the digital structure so that exposure is levelled during production of the interdigital structure.

4,679,015

FERROMAGNETIC RESONATOR

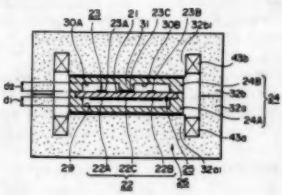
Yoshikazu Murakami, Kanagawa; Seigo Ito, Tokyo; Hiromi Okamoto, Kanagawa, and Hideo Tanaka, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,984

Claims priority, application Japan, Mar. 29, 1985, 60-65874

Int. Cl.[4] H01P *7/08*

U.S. Cl. 333—219 **2 Claims**



1. A ferromagnetic resonator comprising;

a nonmagnetic substrate,

a ferrimagnetic thin film element formed on a major surface of said nonmagnetic substrate,

a strip line disposed at another major surface of said nonmagnetic substrate and electromagnetically coupled to said ferrimagnetic thin film element,

a conductive wall of ground potential facing said strip line, and spaced at a predetermined distance therefrom,

an end of said strip line being connected to said conductive wall of ground potential, and

bias magnetic field means applying a D.C. magnetic field to said ferrimagnetic thin film perpendicular to said major surface thereof.

4,679,016

INTERCHANGEABLE MECHANISM FOR MOLDED CASE CIRCUIT BREAKER

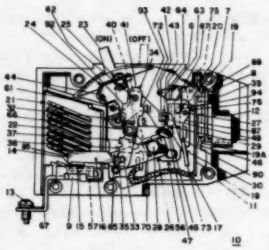
Ronald D. Ciarcia, Southington; Gregory T. DiVincenzo; Richard E. Bernier, both of Plainville, and Joseph G. Nagy, New Britain, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 8, 1986, Ser. No. 817,213

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—132 **21 Claims**



1. An operating mechanism for a molded case circuit breaker of the type consisting of a trip unit arranged in series with a fixed contact and a movable contact said operating mechanism comprising in combination:

a U-shaped handle yoke for supporting an operating handle and a pair of operating springs;

a pair of opposing side frames separated by means of a cradle stop pin;

a knee-shaped cradle member pivotally arranged intermediate said side frames and mounted on a cradle support pivot at one end perpendicularly extending betewen said side frames;

an upper link member pivotally attached to said cradle member on an upper link pivot intermediate said cradle support pivot and a cradle hook on said cradle at an opposite end from said cradle support pin;

a latch assembly comprising a primary latch and a secondary latch, said primary latch engaging with said cradle hook and said secondary latch being pivotally arranged at a top end intermediate said side frames for interaction with said trip circuit by means of a trip bar arranged at a bottom end of said secondary latch;

a lower link member pivotally arranged intermediate a movable contact arm carrier, comprising a pair of slotted yoke members arranged on a crossbar pivot, and said upper link, said operating springs connecting between said U-shaped handle yoke and said lower link for moving said upper link and said lower link to ON and OFF positions in response to movement of said operating handle; and

a movable contact arm supporting a movable contact, said movable contact arm terminating at a pin at one end opposite from said movable contact, said pin being captured within said pair of slots at an end of said movable contact arm carrier supporting said movable contact arm and allowing said movable contact arm to rotate independent of said movable contact arm carrier, said lower link member including a slot at one end for arranging over a pin in said movable contact arm end and said movable contact arm carrier.

4,679,017

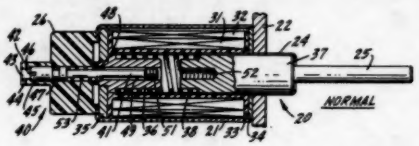
EMERGENCY MANUAL ACTUATION MECHANISM FOR A SOLENOID

Ralph E. Mishler, Deerfield, and Peter J. Stocco, Lombard, both of Ill., assignors to Synchro-Start Products, Inc., Skokie, Ill.

Filed Mar. 19, 1986, Ser. No. 841,166

Int. Cl.[4] H01H *9/20*

U.S. Cl. 335—164 **37 Claims**



1. In a solenoid of the kind comprising an elongated housing, a magnetic plunger disposed within the housing and axially movable between an initial position and an actuation position, one end of the plunger being accessible through one end of the housing for connection to an external apparatus, spring means biasing the plunger toward its initial position, and solenoid coil means for driving the plunger to its actuation position, an emergency manual actuation mechanism comprising:

a retraction rod axially movably mounted in the other end of the solenoid housing in alignment with the plunger, the retraction rod having a normal position in which the retraction rod is effectively disengaged from the plunger and does not interfere with or react to plunger movement;

connecting means for interconnecting the retraction rod and the solenoid plunger;

means for moving the retraction rod from its normal position through an intermediate position to a retraction position, such movement of the retraction rod to its intermediate position engaging the connecting means and such further movement of the retraction rod to its retraction position driving the plunger from its initial position to its actuation position;

and retainer means for retaining the retraction rod and the plunger in their respective retraction and actuation positions.

4,679,018

CIRCUIT BREAKER WITH SHOCK RESISTANT LATCH TRIP MECHANISM

Jere L. McKee, Scott Township, Lawrence County, and Glenn R. Thomas, Brighton Township, Beaver County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1986, Ser. No. 818,947

Int. Cl.[4] H01H *71/14*

U.S. Cl. 335—167 **4 Claims**

1. A circuit breaker comprising:

(a) a housing including a mounting frame;

(b) a circuit breaker structure having a pair of separable contacts and having a releasable lever operable between latched and unlatched positions to open the separable contacts;

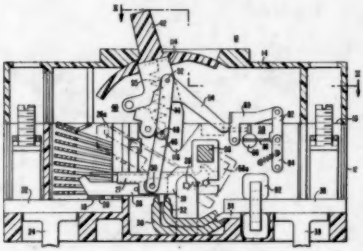
(c) operating means for actuating the contact arm and comprising a first toggle linkage between the releasable lever and the contact arm;

(d) manually operable means to open and close the contacts when the releasable lever is in the latched position;

(e) a trip bar operable automatically in response to overload current conditions above a predetermined value to release the releasable lever from the latched position to the unlatched position to open the contacts,

(f) latching means for latching the releasable lever including a latch lever detachably connected to the releasable lever;

(g) the latching means also including a second toggle linkage comprising a first link pivotally connected to the latch lever, a second link pivotally connected to the mounting



frame, and the first and second links having pivotally connected end portions forming a pivot joint;

(h) the trip bar having a projection for releasably engaging the second toggle linkage so as to cause latching and unlatching of the releasable lever upon rotation of the trip bar; and

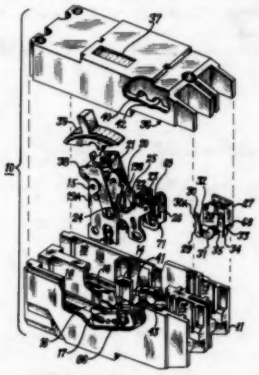
(i) the manually operable means being operable to move the releasable lever from the tripped position to the latched position following release of the releasable lever.

4,679,019

TRIP ACTUATOR FOR MOLDED CASE CIRCUIT BREAKERS

Frank A. Todaro, Clinton; Roger N. Castonguay; Alexander A. Krajewski, both of Terryville, and Robert A. Morris, Burlington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 14, 1986, Ser. No. 862,929
Int. Cl.[4] H01H 9/00
U.S. Cl. 335—172 **19 Claims**



1. A molded case circuit breaker comprising:

an insulative case containing a pair of separable contacts operatively connected with an operating mechanism for opening and closing said contacts;

a circuit breaker latch at a first location within said mechanism for holding said contacts closed against the bias of an over-center operating spring;

a trip actuator comprising a first and a second lever arranged for rotation about a common pivot under the urgence of an actuator spring, said first lever arranged for contacting said circuit breaker latch to displace said circuit breaker latch to a second location thereby articulating said operating mechanism and causing said contacts to open under urgence of said operating spring, said second lever abutting said actuator spring;

a crosspiece attached to said first and second levers for engagement with a latch-piece to retain said first and second levers from rotation against the bias of said actuator spring; and

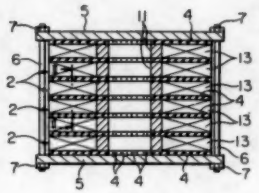
a magnetic module operatively connected with said latch-piece for moving said latch-piece out of engagement with said crosspiece thereby allowing said first and second levers to rotate under the urgence of said actuator spring.

4,679,020

SUPERCONDUCTING SOLENOID AND METHOD OF MAKING SAME

Toshimi Kawamura, and Takashi Satow, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1986, Ser. No. 867,068
Claims priority, application Japan, May 31, 1985, 60-119121
Int. Cl.[4] H01K 7/22
U.S. Cl. 335—216 **10 Claims**



1. A superconducting solenoid comprising: a plurality of coil elements each in the form of a pancake laminated one over another in concentric relation with each other, each of said coil elements including a winding frame in the form of a cylinder, and filamentary conductors wound around said winding frame and then heat treated, and a supporting structure formed of a resinous material impregnated in between said wound filamentary conductors; spacer means formed of an electrically insulating material and interposed between adjacent coil elements for providing electrical insulation and conduits for a cooling medium; and means for assembling together said laminated coil elements and said spacers.

4,679,021

MAGNETIC RETENTION PLATE WITH PERMANENT MAGNETS

Philibert M. Braillon, Montmelian, France, assignor to Braillon & Cie (Societe Anonyme), Montmelian, France

Filed Jun. 20, 1986, Ser. No. 876,920
Claims priority, application France, Jul. 3, 1985, 85 10682
Int. Cl.[4] H01F 7/04
U.S. Cl. 335—295 **6 Claims**

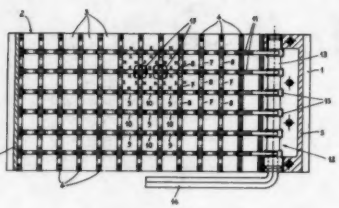
1. In a magnetic retention plate for selectively retaining a magnetically attractable body thereon, said magnetic retention plate comprising a planar array of pole pieces, end faces of said pole pieces defining a planar retention surface, an array of fixed permanent magnets magnetized in a common direction and positioned to apply a magnetic field to said pole pieces, an array of movable permanent magnets magnetized in a direction perpendicular to said common direction, an actuating mechanism for the translational displacement of said array of mov-

able permanent magnets for displacing said movable permanent magnets relative to said fixed permanent magnets between a first position in which lines of force of said arrays of permanent magnet close within the interior of said plate, and a second position wherein lines of force of said arrays close externally of said plate through said end faces of said pole pieces, the improvement wherein:

all of said pole pieces are fixed, disposed in a checked pattern of orthogonal rows of pole pieces, and separated by partitions having edges defining said planar retention surface with said end faces;

the permanent magnets of said array of fixed permanent magnets are located below said partitions in pairs of mutually parallel rows with the fixed permanent magnets of one row of each pair being poled oppositely to the fixed permanent magnets of the other row of the respective pair and being of alternating direction of polarity along the respective row from fixed permanent magnet to fixed permanent magnet therealong, all said fixed permanent magnets being magnetized parallel to a longitudinal dimension of said plate;

the permanent magnets of said array of movable permanent magnets are located below said partitions in pairs of mutually parallel rows with the movable permanent magnets of



one row of each pair being poled oppositely to the movable permanent magnets of the other row of the respective pair and being of alternating direction of polarity along the respective row from movable permanent magnet to movable permanent magnet therealong, all said movable permanent magnets being magnetized parallel to a transverse dimension of said plate;

each of said pole pieces has four sides, a first two opposite sides of which are juxtaposed with faces of the fixed permanent magnets of the same polarity and another two opposite side of which are flanked by a said pair of rows of said movable permanent magnets; and

said actuating mechanism is constructed and arranged to displace said movable permanent magnets by a stroke corresponding to a pitch of separation of said pole pieces parallel to said longitudinal dimension whereby in said first position faces of opposite movable permanent magnets are juxtaposed with said other two opposite sides and have opposite polarity to the fixed magnet faces juxtaposed with the first two opposite sides of each pole piece, and whereby in said second position faces of opposite movable permanent magnets are juxtaposed with said other two opposite sides and have the same polarity as the fixed magnet faces juxtaposed with the first two opposite sides of each pole piece.

4,679,022

MAGNETIC FIELD GENERATING DEVICE FOR NMR-CT

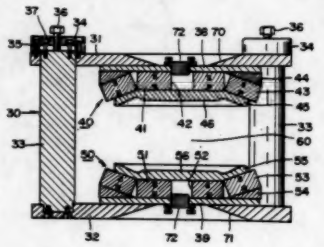
Toshinobu Miyamoto; Hiroo Hayashi; Hideya Sakurai; Hirofumi Takabayashi, and Youichi Ohnishi, all of Mishima, Japan, assignors to Sumitomo Special Metal Co. Ltd., Osaka, Japan

Filed Sep. 19, 1986, Ser. No. 909,327

Claims priority, application Japan, Dec. 27, 1985, 60-203549[U]; Apr. 30, 1986, 61-99938[U]

Int. Cl.[4] H01F *7/02*

U.S. Cl. 335—296 **13 Claims**



1. A magnetic field generating device for nuclear magnetic resonance-computerized tomography of the type wherein permanent magnet assemblies of a pair opposing mutually to define an air gap therebetween are magnetically coupled together by yoke means to create a magnetic field within said air gap, characterized in that

each of said permanent magnet assemblies comprises a flat plate-like central permanent magnet and a plurality of peripheral permanent magnets arranged around said central permanent magnet and inclined toward the inside of said air gap,

the magnetic pole surface of each of said permanent magnet assemblies forms a curved concave face with respect to said air gap, and

each of said permanent magnets is magnetized in the direction perpendicular to the corresponding magnetic pole surface.

4,679,023

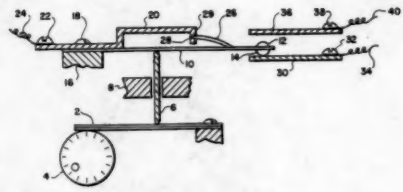
OVER-TEMPERATURE CONTROL FOR A THERMOSTAT

Marvin D. Nelson, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 14, 1986, Ser. No. 896,351

Int. Cl.[4] H01H *61/08, 71/14*

U.S. Cl. 337—140 **5 Claims**



1. A thermostat comprising

a cantilevered spring means having an unactuated first position carrying electrical contacts at a free end thereof,

a heat responsive means including a memory material element having a first shape below a predetermined critical temperature and a second shape above said temperature,

means connecting said heat responsive means to said spring means to enable said heat responsive means to urge said spring means into a predetermined second position above

said temperature to transfer the electrical contacts from a first position to a second position and

bi-metallic temperature responsive means connected to said spring means for transferring said electrical contacts on said spring means between said first and second positions independently of said heat responsive means.

4,679,024

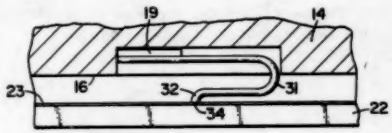
POTENTIOMETER CONTACT WIPER

Karl A. Kittleson, Northwood, Iowa, assignor to Northern Engineering, Inc., Northwood, Iowa

Filed Sep. 27, 1985, Ser. No. 781,266

Int. Cl.[4] H01C *10/30*

U.S. Cl. 338—160 19 Claims



1. A potentiometer comprising:

a housing;

a substrate mounted in said housing and having a resistance element and a conductive element disposed on a surface thereof;

a contact wiper including a plurality of wire contact fingers each connected at a first end to a bus bar and free at the other end;

means for moveably supporting said contact wiper in said housing for wiping contact with said resistance element and said conductive element whereby a circuit is formed from said conductive element to said resistance element; and

said fingers in contact with said resistance element supported so that the endpoint of each finger contacts the resistance element with a resilient force.

4,679,025

CONSTRUCTION FOR ELECTRICAL CONTROL PANEL

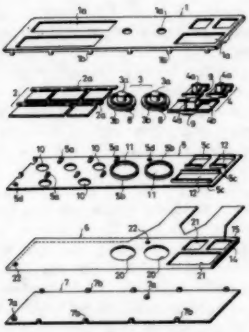
Yoshihiro Ohashi, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 2, 1985, Ser. No. 803,542

Claims priority, application Japan, Dec. 1, 1984, 59-181554[U]; Dec. 1, 1984, 59-181555[U]; Dec. 1, 1984, 59-181556[U]

Int. Cl.[4] H01C *10/00*

U.S. Cl. 338—197 3 Claims



1. A construction for an electrical control panel comprising a circuit pattern on one side of an insulating sheet, a sliding member slidable on said circuit pattern of said insulating sheet, a rotary operating member for operating said sliding member, said sheet being sandwiched between a pair of support plates with one of said support plates disposed on said circuit pattern side of said insulating sheet, and means for slidably and engagedly holding said rotary operating member in position for operating said sliding member, including an operating hole formed through said one support plate and an upturned annular holding wall surrounding said operating hole and having an inner annular surface for holding said operating member rotatably and engagedly with said operating member projecting from said operating hole provided in said one support plate.

4,679,026

CAR RADIO THEFT ALARM SYSTEM

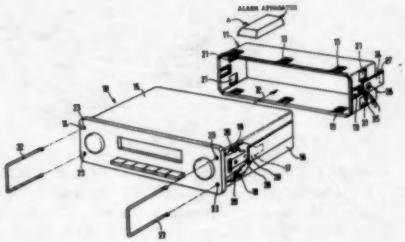
Rolf Knakowski, Hildesheim, and Dieter Fahlbusch, Diekholzen, both of Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Nov. 18, 1985, Ser. No. 799,028

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443650

Int. Cl.[4] G08G *13/14*

U.S. Cl. 340—63 8 Claims



1. Electric theft alarm system for accessory apparatus installed in a vehicle, particularly automobile audio apparatus

in which the accessory apparatus includes a housing (15), and the vehicle has an alarm apparatus, and a receiving frame (11) is provided within the vehicle for telescopically receiving the housing (15) of the accessory apparatus, said receiving frame and the accessory apparatus being formed with releasable engagement means (17, 18, 21) for securing the accessory apparatus in the frame and hence in the vehicle,

wherein, in accordance with the invention,

the housing (15) of the accessory apparatus and the receiving frame (11) are connected into an electrical circuit, coupled to the alarm apparatus, and form a switch which changes state upon relative movement of the housing of the accessory apparatus and the receiving frame to actuate the alarm apparatus upon movement of the housing of the accessory apparatus in a direction of removal from the frame,

wherein the switch includes a contact leaf spring (24) having a free end (27), which free end is bent or bowed out of the major plane of the leaf spring, said bent or bowed end forming a switch terminal contact.

4,679,027

VIDEO DISPLAY CONTROL UNIT

Keizo Higuchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,218

Claims priority, application Japan, Jul. 24, 1984, 59-156017

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—723 3 Claims

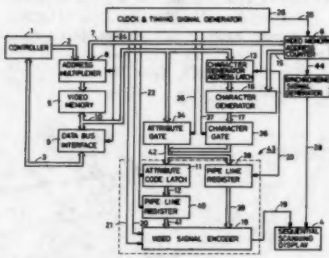
1. A video display control unit for displaying picture images

on a sequential scanning display unit, said video display control unit comprising:

a character generator for generating character information;

a video memory including storage regions for storing both character address information to be supplied to said character generator to specify a character to be displayed and attribute information for qualifying said character to be displayed, said video memory for storing data defining said picture images to be periodically displayed on the screen of said display unit;

reading means for reading said data stored in said video memory synchronously with a scanning sequence of said screen including means for reading said character information and said attribute information from said video memory and for reading corresponding character information from said character generator on the basis of said read character address information;



multiplexing and outputting means to multiplex said character information and said read attribute information and output the same including first gate means for gating said attribute information, second gate means having an output end commonly connected to an output end of said first gate means for gating said character information, and timing signal generator means for sequentially switching said first and second gate means thereby to generate timing signals for multiplexing said attribute information and said character information;

delay means for delaying said data multiplexed by said multiplexing and outputting means by a predetermined period thereby to synchronously output data pairs of said character information and said attribute information in parallel; and

a video encoder for receiving said data in parallel, said data having been delayed by said delay means thereby to convert said data into video signals to be supplied to said display unit.

4,679,028

FAULT DETECTION ALGORITHM FOR SUCCESSIVE-APPROXIMATION A/D CONVERTERS

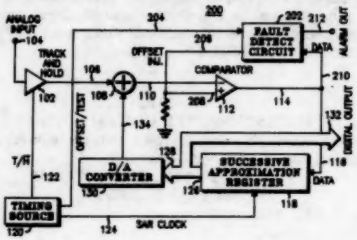
Timothy J. Wilson, Bartlett, and Paul M. Erickson, Hanover Park, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 31, 1986, Ser. No. 846,385
Int. Cl.[4] N03M *1/10*
U.S. Cl. 340—347 CC **18 Claims**

1. A method for achieving self-test capability in a successive approximation A/D converter having a comparator which has accessible a pair of inputs and an output therein, the method comprising the steps of:

injecting into an input of said comparator at the end of each conversion cycle an offset having a sign that alternates for each conversion cycle and a small magnitude that slightly exceeds a level discernible as one least significant bit; and

verifying that the output of the comparator shifts in a manner corresponding to the alternating sign of said injected offset, thereby achieving self-test of virtually all of the



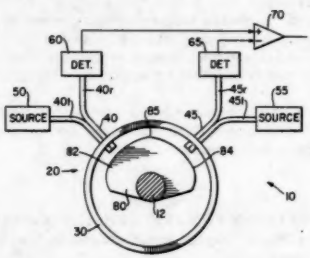
A/D converter elements over a wide range of input values in a fraction of an entire conversion cycle.

4,679,029

OPTOELECTRONIC ROTATIONAL POSITION SENSOR

David A. Krohn, Hamden; David R. Maack, Madison; Edmond I. Vinarub, Cheshire, and John R. Ellison, Jr., Bethany, all of Conn., assignors to Eotec Corporation, West Haven, Conn.

Filed Sep. 4, 1984, Ser. No. 647,031
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 P **8 Claims**



1. Apparatus for sensing the rotational position of a shaft, comprising:

light source means;

first light detecting means for producing an electrical output signal in response to light received at a sensing portion thereof;

second light detecting means for producing an electrical output signal in response to light received at a sensing portion thereof;

circuit means differentially responsive to the output signals of said first and second light detecting means for producing a signal indicative of rotational position of said shaft;

means for providing a first light transmission path between said light source means and said first light detecting means;

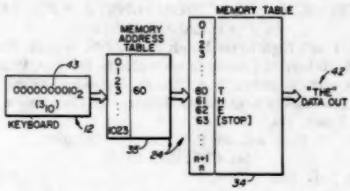
means for providing a second light transmission path between said light source means and said second light detecting means; and

means mechanically coupled to said shaft for varying the length of the paths of said first and second means for providing a light transmission path, the length of said first and second light transmission paths being varied in relationship to the rotational displacement of said shaft from a predetermined reference position so that one of said paths is lengthened while the other is shortened.

4,679,030
CHORDING KEYBOARD FOR GENERATING BINARY DATA

William M. Volnak, 50 Birch St., Mill Valley, Calif. 94941

Continuation of Ser. No. 373,569, Apr. 30, 1982, Pat. No. 4,467,321. This application Jul. 3, 1984, Ser. No. 627,380
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] G06F 3/02
U.S. Cl. 340—365 A 10 Claims



1. A computer data entry keyboard comprising:

exactly ten key switches, each key switch corresponding to a particular terminating member of a pair of operator's hands, and adapted to be selectably operated by such corresponding terminating member, said switches being selectably operably singly and in combination to generate a 10-digit binary number, each digit of said binary number corresponding to a particular terminating member of said operator's hands;

memory table means including read-only first memory means and read/write second memory means for storing and retrieving respective first and second sets of character and character combinations;

memory address table means, having an input and an output, for providing addressed in said memory table means at said output in response to 10-digit binary numbers at said input, wherein each location in said memory address table means corresponds uniquely to a different 10-digit binary number and contains an address in said first and second memory means said address corresponding to a character or character combination stored in said memory table at that address;

means, coupled to said memory table means and to the output of said memory address table means for applying the address provided at said output to said memory table means; and

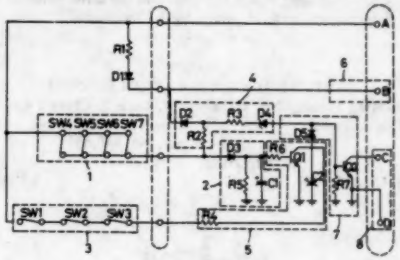
means, associated with said read/write second memory means and responsive to said key switches, for allowing operation of said memory means in a write mode wherein operation of said key switches stores characters and character combinations each corresponding to a particular one of said 10-digit binary numbers, and operation in a read mode wherein operation of said key switches retrieves character and character combinations, operation in said write mode being initiated by the occurence of an access code and terminated by the occurrence of an exit code, each of said access and exit codes being particular ones of said 10-digit binary numbers.

4,679,031
DEVICE TO FACILITATE THE ARMING OF AN ALARM SYSTEM AND TO PROVIDE LOCK-OUT PROTECTION

Shih-Ming Hwang, No. 11, Alley 12, Lane 7, Ching-Tyan St., Taipei, Taiwan

Filed Aug. 29, 1985, Ser. No. 770,752
Int. Cl.[4] G08G 23/00; E05B 45/06
U.S. Cl. 340—501 3 Claims

1. A device to facilitate the activation of an alarm system, including a first set of reed switches operable to generate a correct signal and a second set of reed switches operable to generate an incorrect signal, a driving circuit to arm the alarm system in response to either said correct or said incorrect signal and responsive to said correct signal when the alarm system is armed to disarm the alarm system, and a correct signal disable timing circuit responsive to said incorrect signal to disable said

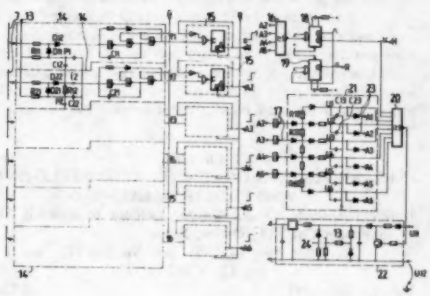


correct signal from disarming the alarm system when the correct signal is given within a preset lock-out time after the receipt of said incorrect signal.

4,679,032
PROCEDURE AND MEANS FOR PRODUCING A CONTRAST IMAGE

Nils-Robert Roschier, Vantaa, Finland, assignor to Elevator GmbH, Baar, Switzerland

Filed Dec. 5, 1984, Ser. No. 679,032
Claims priority, application Finland, Dec. 14, 1983, 834600
Int. Cl.[4] G08B 13/26
U.S. Cl. 340—562 16 Claims



1. A procedure for producing an image based on contrast discrimination in an image forming means of at least one-dimensional image filed with discrete picture elements, comprising:

detecting an image signal for each said picture element to produce an output thereof:

applying a first electric current to an image forming channel having a tapping point with a voltage, said first current affecting a second current, having an output frequency, flowing into said tapping point of said image forming channel;

connecting said tapping point to corresponding tapping points of other image forming channels and simultaneously affecting said voltage of said tapping point, in such a manner that the product of said second current value and said voltage value is proportional to said first current value, and wherein the output related to said picture element has an output frequency proportional to the output frequency of said second current;

supplying a suitable current to an interaction network connecting, by means of suitably selected impedances, said tapping point of said image forming channel to the tapping points of the image forming channels of other picture

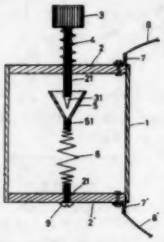
elements, such that a desired contrast heightening of the image is achieved and such that said output frequency of each said image forming channel combine to form a frequency image, which becomes the basic information for interpretation of the image by digital means.

4,679,033

STRUCTURE OF VIBRATION SENSOR

Shih-Ming Hwang, No. 11, Alley 12, Lane 7, Ching-Tyan St., Taipei, Taiwan

Filed Mar. 18, 1986, Ser. No. 840,851
Int. Cl.[4] H01H *35/02, 35/14*
U.S. Cl. 340—566 **2 Claims**



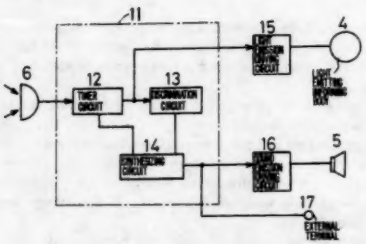
1. A base, an electricaliy conductive hopper, a spring in the form of a winding extending between said hopper and said base and supporting said hopper over said base, an electrically conducting element extending into said hopper without touching said hopper when said spring is in an equilibrium position at rest, said winding of said spring having its greatest diameter at a middle point of said spring between said hopper and said base and decreasing in diameter proceeding from said middle point toward said hopper and said base, said winding having its least density at said middle point and increasing in density proceeding from said middle point to said hopper and said base.

4,679,034

INFRARED INTRUSION SENSOR WITH PRELIMINARY AND PRIMARY ALARMS

Daikichi Kamada, Osaka, Japan, assignor to Kamada Signal Appliances Co., Ltd., Osaka, Japan

Filed Aug. 14, 1985, Ser. No. 765,947
Int. Cl.[4] G08B *13/18*
U.S. Cl. 340—567 **5 Claims**



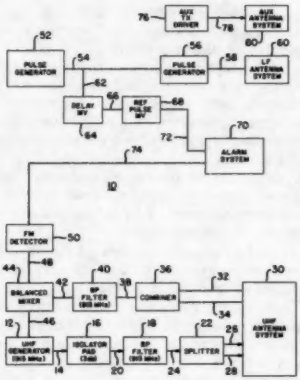
1. An intrusion alarming apparatus comprising:
a main body case of horn shape having an opening at one end thereof,
an infrared ray sensor disposed substantially in the center of the opening of the main body case,
a first alarming means for producing preliminary alarm of a predetermined period of time,
a second alarming means for producing primary alarm following said preliminary alarm signal,
a control unit for receiving an output from said infrared ray sensor, said control unit including a timer circuit having a re-triggerable function, a discrimination circuit and synthesizing circuit, whereby
preliminary alarm is produced upon detecting an intrusion and primary alarm is followed only if such intrusion continues for a predetermined period of time.

4,679,035

TRI-SIGNAL ELECTROMAGNETIC ARTICLE SURVEILLANCE SYSTEM

Paul H. Pfaff, Lighthouse Point; Richard N. Spagna, Pompano Beach; Robert A. Clucas, Lauderdale-By-The-Sea; Paul Coulson, Deerfield Beach, and Ezra D. Eskandry, Miami, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Jul. 30, 1985, Ser. No. 760,680
Int. Cl.[4] G08B *13/18*
U.S. Cl. 340—572 **29 Claims**



1. A system for electronic article surveillance in an area having a surveillance zone and an article display zone adjacent said surveillance zone, said system including:
(a) means for transmitting into said area a high-frequency signal;
(b) means for transmitting into said area a primary low-frequency signal comprised of a carrier with a modulation characteristic;
(c) receptor-reradiator means affixed to articles in said area for transmitting output signals having content corresponding to transmitted signals incident thereon and inclusive of said modulation characteristic and such low-frequency carrier;
(d) receiver-detector means in said surveillance zone for receiving such receptor-reradiator means transmitted signals and having capability for providing output indication of said modulation characteristic therein if same is in predetermined ratio to low-frequency carrier content thereof and thereupon to generate an alarm condition; and
(e) means for transmitting into said area an auxiliary low-frequency signal comprised of an unmodulated carrier for selectively increasing low-frequency carrier content of said receptor-reradiator means transmitted signals for receptor-reradiator means in said article display zone to cause the ratio of said modulation characteristic in such selected receptor-reradiator means transmitted signals to low-frequency carrier content thereof to be less than said predetermined ratio and thereupon to preclude generation of said alarm condition.

4,679,036

SIGNALLING DEVICE FOR INDICATING A NURSED PERSON IN A BAD SLEEPING CONDITION

Tseng-Yng Cheng, 31, Lane 98, Chien Hsing Road, Chung Li City, Taiwan

Filed Apr. 29, 1985, Ser. No. 728,178
Int. Cl.[4] G08B 23/00
U.S. Cl. 340—573 3 Claims

1. A signalling device for indicating a person, who is being nursed, in a bad sleeping condition comprising: means for detecting said bad sleeping condition, adapted to be mounted on the body of said person for outputting a voltage signal when said bad sleeping condition is detected; a switching circuit coupled to said detecting means; a signal generating circuit coupled to said switching circuit for being turned on by said switching circuit is response to said voltage signal from said detecting means in order to output an alarm signal; and a frequency modulating circuit coupled to said switching circuit for being turned on thereby in response to said voltage signal, and also coupled to said signal generating circuit for receiving said alarm signal and frequency modulating it to radiate out a radio wave which is adapted to be received and reproduced by an FM receiver in order to signal that said nursed person is in said bad sleeping condition; the detecting means consisting of a detecting circuit containing a combination of sensors, one of said sensors being sensitive to light, one of said sensors being sensitive to temperature, and one of said sensors being sensitive to urination, any which of said sensors being capable of detecting a bad sleeping condition, wherein the temperature sensor is a thermistor capable of varying its resistance value in accordance with the temperature value on said person's body is provided, and a comparator is coupled to said thermistor at one input terminal thereof, connected to a reference voltage at the other input terminal, and coupled to said switching circuit at the output section thereof, so that when said quilt is moved away from the person's body, the temperature value around said thermistor decreases, causing said comparator to actuate said switching circuit to turn on said signal generating circuit and said frequency modulating circuit in response to the variation of resistance value of said thermistor.

4,679,037

ATTACHMENT FOR SMOKE ALARMS

Horace Bryan, 12 Brighton La. 10, Brooklyn, N.Y. 11235, and Nicholas Giardina, 50-11 Poyer St., Elmhurst, N.Y. 11373

Filed Dec. 16, 1985, Ser. No. 809,320
Int. Cl.[4] G08B 17/10, 21/00
U.S. Cl. 340—693 11 Claims

1. In an attachment for use with smoke alarms of the type to be mounted in an elevated position in a space to be monitored for occurrence of smoke and which comprise a housing carrying an electrically operated signal device, a smoke responsive device, and circuit means connected to the signal device and the smoke responsive device and including a connector for connection to a battery, the combination of

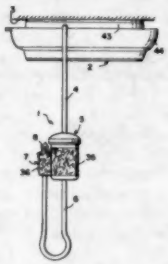
an elongated flexible electrical lead;

switch means supported by the lead;

connector means at an end of the lead spaced a substantial distance from the switch means and operative for connecting a battery to the circuit means of the smoke alarm only when the connector means is connected to the connector of the circuit means of the smoke alarm and the switch means is in a predetermined first condition,

the switch means being operative to have a second condition disabling the smoke alarm;

the combination of the electrical lead, switch means and connector means constituting a flexible pendant which can depend from the smoke alarm with the switch means in a first position substantialy below the smoke alarm



when the connector means is connected to the connector of the circuit means of the smoke alarm; and

releasable means for releasably securing the switch means in a second position substantially above said first position,

the switch means being in said first condition when occupying said second position,

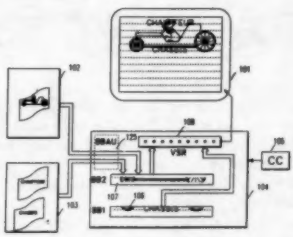
the switch means being in a second condition, in which the smoke alarm is disabled, when the switch means occupies said first position.

4,679,038

BAND BUFFER DISPLAY SYSTEM

David F. Bantz, Chappaqua, N.Y.; Davey L. Malaby, Danbury, Conn., and Paul N. Sholtz, Brewster, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,429
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—721 4 Claims



1. A composite display system of the multi-port type, having a composite display as a primary display selectively modified by one or more superimposed or inset secondary displays, the composite display being a video raster including K multiple-line video bands, the system having video input means matched to the display, and having a source of pixel representations for the primary display, the system comprising:

(a) band buffer means including at least a temporarily assigned "next" band buffer for accumulating a band of the composite display as a plural line subimage of actual pixel representations;

(b) image memory means for providing to said band buffer means actual pixel representations of the secondary display;

(c) display list memory means, for storing the addresses in said image memory means of various segments of display data stored in said image memory;

(d) data address storage means, for storing the addresses of data in said display list memory means so as to derive addresses for a composite display;

(e) gating means for gating pixel representations from predetermined locations in said image memory means, called for by said display list memory means according to addresses specified by said display list memory means and said data address storage means, to storage locations in said band buffer means, whereby said "next" band buffer accumulates pixel representations for an assigned band of the composite display;

(f) transfer means for transferring the accumulated pixel representations from the band buffer means to the video input means; and

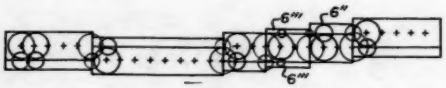
(g) control means to control said gating means and said transfer means to accumulate in said "next" band buffer the pixel representations for a band of the composite display, and to control said transfer means to transfer the pixel representations accumulated in said "next" band buffer to the video input means.

4,679,039

SMOOTHING DISCONTINUITIES IN THE DISPLAY OF SERIAL PARALLEL LINE SEGMENTS

Robert B. Neil, Harvard, and George L. Adleman, Brockton, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1983, Ser. No. 551,247
Int. Cl.[4] G09G 1/06
U.S. Cl. 340—728 **3 Claims**



1. Apparatus for displaying contiguous line segments along spaced parallel paths in such manner as to smooth the discontinuities that occur at the near ends of line segments that are on adjacent parallel paths, comprising

means partly displaying each segment of data with a first width along its path,

means for completing the display of data segments lying between other data segments on an adjacent path by forming a first auxiliary line of a second width that is less than the first width along said adjacent path, and

means for completing the display of data segments lying between adjacent data segments that are respectively in paths on the opposite sides of the path of the said data segment by

(1) forming second auxiliary lines with said second width respectively along the paths of said adjacent line segments, the said latter auxiliary line extending along a fraction of said line segment from the ends of said adjacent line segments, and

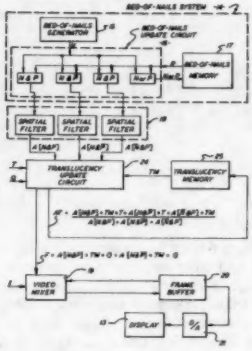
(2) forming third auxiliary lines of a third width that is less than the second width in the paths of said adjacent line segments along the remainder of said line segment.

4,679,040

COMPUTER-GENERATED IMAGE SYSTEM TO DISPLAY TRANSLUCENT FEATURES WITH ANTI-ALIASING

Johnson K. Yan, Milpitas, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,045
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—747 **3 Claims**



1. In a computer image generator having geometric processor means to prioritize faces of images to be displayed and for providing predetermined intensity information for said faces, having at least one video processor means including memory means to store temporarily information on each point to be displayed, and having display means to produce a visual representation of said images to be displayed, said video processor means comprising:

integrator circuit means connected to receive information from said geometric processor means on the priority and the intensity assigned to each face of images to be displayed;

skip-over logic circuit means connected to receive information from said integrator circuit means to identify any areas in the faces of images to be displayed not requiring further intensity modification, and separating such identified areas for temporary storage;

translucency update circuit means connected to receive information from said skip-over logic circuit means to identify those areas requiring further intensity modification in accordance with an assigned priority, the translucency update circuit means including:

means to separate each area that requires further intensity modification into its own path and for modifying the intensity of each area that is separated in accordance with the relationship:

$$AT = \frac{A[N\&P] \times TM \times T + A[N\&\overline{P}] \times T + A[\overline{N}\&P] \times TM}{A[N\&P] + A[N\&\overline{P}] + A[\overline{N}\&P]}$$

where:
AT = Average Translucency,
A = Area inside brackets,
N = current face data value,
P = previous face data value,
& = the logical AND,
TM = Translucency value,
$\overline{P}$ = complement of P,
$\overline{N}$ = complement of N;

means to recombine the informationn from each path after intensity modification to form a combined signal according to the relationship:

$$F=A[N\&P]\times TM\times Q+A[N\&\overline{P}]\times TM\times Q$$

where:
F=the Resulting Intensity,
A=a fractional area,
N=the current intensity,
P=the previous intensity,
TM=data stored in memory,
&=a logical AND value,
Q=the opacity data value,
$\overline{P}$=the complement of P;
and

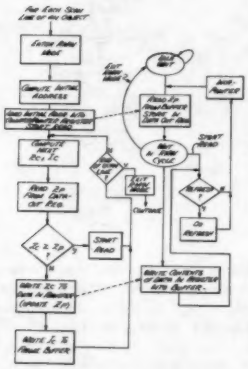
circuit means to connect said combined signal from said translucency update circuit means to said display means.

4,679,041

HIGH SPEED Z-BUFFER WITH DYNAMIC RANDOM ACCESS MEMORY

John L. Fetter, Los Altos; Jerald R. Evans, Mountain View, and Serdar Ergene, San Jose, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jun. 13, 1985, Ser. No. 744,496
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—747 **45 Claims**



1. A computer display system having a processor for generating images comprised of a plurality of points, and display means for displaying said images, said display means including a plurality of selectively enabled display elements, comprising:

buffer means coupled to said processor for storing a plurality of Z_p values, said Z_p values corresponding to an element on said display and a point of an image previously generated by said processor, and representing a perspective Z depth of said image;

reading means coupled to said buffer means for reading Z_p values from said buffer means;

Z_c value computation means coupled to said processor for calculating a Z_c value for each point of an image generated by said processor to be displayed;

control means coupled to said reading means and said processor, for signalling said reading means to read the next Z_p value generally concurrent with the calculation of the corresponding Z_c value for said image generated by said processor to be displayed;

comparison means coupled to said processor for comparing said calculated Z_c value to said Z_p value read from said buffer, such that if said calculated Z_c value is less than said read Z_p value, said calculated Z_c value replaces said read Z_p value in said buffer, otherwise said read Z_p value is retained in said buffer;

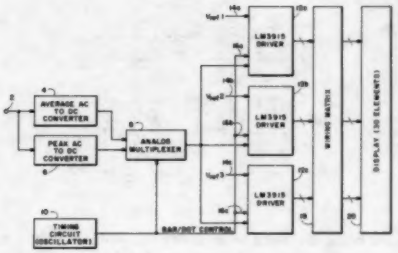
whereby said Z values are compared and updated at high speed.

4,679,042

BAR/DOT LEVEL METER

Paul M. Trethewey, Penn Valley, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Apr. 22, 1985, Ser. No. 725,604
Int. Cl.[4] G01R 19/04; G09G 3/14
U.S. Cl. 340—754 **4 Claims**



1. A device for providing a visual indication of the value of a variable of an electrical signal, comprising:

a plurality, n, of driver circuits each having an input terminal for receiving said electrical signal and a plurality, m, of output terminals, and each driver circuit being operable in at least a first mode in which it provides an output signal at at least its ith output terminal (where i lies in the range from one to m) when the value of said variable lies within a range corresponding to the ith increment on a scale of m increments;

n linear array of m light emitting elements, each linear array being associated with respective ones of the n driver circuits, with the ith element of each linear array being coupled to the ith output terminal of the driver circuit associated therewith and being positioned in the linear array between the (i−1)th element and the (i+1)th element, the elements of the n linear arrays being interdigitated to form a linear grand array of m×n light emitting elements with the ith element of the jth array (where j lies in the range from one to n) being adjacent at least one of the ith element of the (j+1)th array, the ith element of the (j−1)th array, the (i+1)th element of the first array and the (i−1)th element of the nth aray; and

means whereby said driver circuits are adjusted so that the scale of m increments associated with the jth driver circuit overlaps by ((m−1)+(n−1)/n) increments the scale of m increments associated with at least one of the (j−1)th circuit and the (j+1)th circuit.

4,679,043

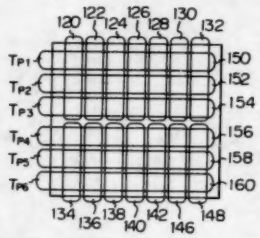
METHOD OF DRIVING LIQUID CRYSTAL MATRIX DISPLAY

Shigeru Morokawa, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 566,075
Claims priority, application Japan, Dec. 28, 1982, 57-231476
Int. Cl.[4] G09G 3/36
U.S. Cl. 340—784 **9 Claims**

1. A method of driving a liquid crystal display matrix display panel having a plurality of mutually independent row electrodes coupled to receive periodically generated timing signal pulses, applied successively to all of said row electrodes during each of successively occurring scanning field periods, and a plurality of column electrodes coupled to column electrode

drive circuit means for receiving in synchronism with said timing signal pulses drive signals representing display data, with a plurality of liquid crystal display elements being formed at intersections of said row electrodes and column electrodes, said column electrodes being divided into at least a first set of column electrodes for driving liquid crystal display elements in a first region of said display panel in conjunction with a first set of said row electrodes and a second set of column electrodes for driving liquid crystal display elements in a second region of said display panel in conjunction with a second set of said row electrodes, said first and second sets of column electrodes being mutually independent, said column electrode drive



means being divided into mutually independent first and second column electrode drive means for driving said first and second sets of column electrodes respectively, and wherein each of said regions operates alternately in a drive phase, during a specific portion of said scanning field period, in which drive signals are applied to the column electrodes thereof and timing signal pulses are applied sequentially to select the row electrodes thereof, and a rest phase, during another portion of said scanning field period, in which a potential substantially equal to zero is applied across all of the display elements thereof, and wherein while one of said regions is operating in said rest phase the other one of said regions is operating in said drive phase.

4,679,044

ARRANGEMENT FOR ILLUMINATING PASSIVE DISPLAY

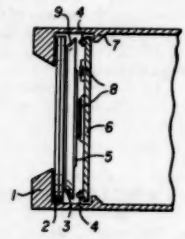
Peter Knoll, Ettlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,745

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331724

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—815.2 **5 Claims**



1. An arrangement for illumination of a passive display element by means of light sources, comprising a housing having an opening displaying said passive display element; a light guide system through which light from the light sources is applied onto the passive display element, said light guide system being flat, said light guide system being formed as a plat having a uniform thickness over its total area and a backside facing said light sources and provided with an imprint applied thereon for decoupling light over a portion of the area of said backside, said plate having a peripheral edge which is sloped, and wherein at least two light source are used, which are light-emitting diodes each formed as a Chip-LED the light output from which is coupled immediately into said light guide system in the region of said peripheral edge; and a carrier plate, said light-emitting diodes being mounted on said carrier plate, said housing accommodating said passive display element, said system and said carrier plate, said housing having inwardly extended projections spaced from each other to support therebetween said passive display element, said light guide system and said carrier plate which are respectively positioned and retained in that order by said projections so that a compact and flat display cell is formed.

4,679,045

SEQUENCING DATA TRANSMISSION PROCESS

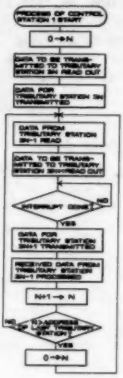
Yuuichi Sadamori, and Keini Maeda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1985, Ser. No. 736,381

Claims priority, application Japan, May 22, 1984, 59-101758

Int. Cl.[4] H04Q *9/00*

U.S. Cl. 340—825.07 **2 Claims**



1. A data transmission process for tranferring data between a control station and a plurality of tributary stations connected with said control station by a common transmission line, wherein each of the control station and the tributary stations includes a processor for collecting and processing blocks of data, and an interface connected between the processor and the transmission line for receiving and transmitting blocks of data from and to the transmission line; the data transmission process comprising the steps of:

selecting, by means of the control station, the tributary stations one at a time in a predetermined sequence for receipt and transmission of data;

transferring a block of data previously collected by the control station processor for each selected tributary station to the control station interface when each tributary station is selected;

transmitting the transferred selected tributary block of data by the control station interface over the transmission line from the control station to the selected tributary station;

processing, during the transmission of the selected tributary block of data, previously received control station data by the control station processor;

collecting, during the transmission of the selected tributary block of data, a next control station block of data by the processor of the selected tributary station;

transferring the selected tributary block data by the selected tributary station processor from the selected tributary station interface after the transmission of the selected tributary block of data is completed;

transferring the next control station block of data collected by the selected tributary station processor to the selected

tributary station interface after the transfer of the selected tributary block of data from the selected tributary station interface is completed;

transmitting the transferred next control block of data by the selected tributary station interface over the transmission line from the selected tributary station to the control station;

processing, during the transmission of the next control block of data, the selected tributary station block of data by the selected tributary station processor;

collecting, during the transmission of the next control block of data, a next selected tributary block of data by the processor of the control station; and

transferring the next control station block of data by the control station processor from the control station interface after the transmission of the next control station block of data is completed.

4,679,046

TRANSPONDER SYSTEMS

Stephen P. Curtis, High Wycombe, and Gary V. Jordan, Reading, both of England, assignors to Senelco Limited, Berkshire, England

Filed Dec. 17, 1985, Ser. No. 810,026

Claims priority, application United Kingdom, Dec. 21, 1984, 8432562

Int. Cl.[4] G01S *13/80*; G08B *13/24*; H01Q *7/00*

U.S. Cl. 342—51 **2 Claims**

1. A transponder system, comprising:

A transponder adapted to be attached to an object to be identified;

an interogator for interrogating the transponder and comprising:

an antenna system including first and second antennae, said first antenna being formed as a loop, said second antenna being formed as a figure-of-eight configuration, and said first and second antennae being generally coplanar;

a source of electrical power for providing first and second transmission signals to said first and second antennae, respectively;

phase shift means for introducing a phase shift between said first and second transmission signals whereby said first and second antennae create an electromagnet interrogating field in a desired region, the field having a non-zero value at all points within the desired region for activating said transponder regardless of the orientation of the transponder.

4,679,047

TERMINAL-GUIDANCE OR POSITION-ADJUSTMENT SYSTEM FOR AIRCRAFT USING DISTANCE AND ANGLE MEASUREMENTS

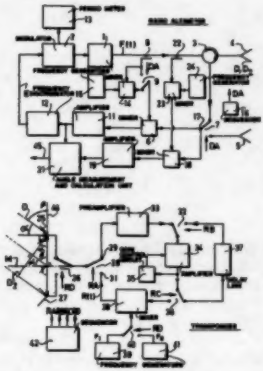
Jean-Pierre Tomasi, Les Molieres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1985, Ser. No. 737,012

Claims priority, application France, May 29, 1984, 84 08391

Int. Cl.[4] G01S *13/87*

U.S. Cl. 342—52 **1 Claim**



1. A position control system for aircraft including a radio altimeter installed aboard the aircraft for measurement of the altitude H and for cooperation with a transponder installed on the ground at a site A, the radio altimeter being of the frequency-modulated continuous-wave type and having a transmitting aerial and a receiving aerial directed towards the ground, the transponder being of the pseudo-continuous-wave type comprising switches for effecting operation at different radio frequencies and at least one transmitting aerial, characterized in that the radio altimeter is adapted for performing a first sequence of measurements where the measurement of altitude H is performed alternately with the measurement of distance D and the angle β in relation to a horizontal axis extending to the transponder, said system comprising:

(a) in the radio altimeter, first means for adapting the transmitting aerial as a transmitting/receiving aerial connected via a circulator and the common contact of a two-position UHF switch to two mixtures each receiving at a second input thereof a respective local oscillation frequency, frequency-shifted by a predetermined value of F_1 and F_2, respectively, and a chain for processing a signal from the transponder, said chain including one of the mixers for determination of the angle β; and

(b) in the transponder, an aerial base comprising two omnidirectional receiving/transmitting aerials directed upwards and separated by a predetermined distance l from one another on the horizontal axis whose orientation is known on board the aircraft, said aerials being selectively connected to an input/output point of the transponder by means of a UHF switch controlled in accordance with a second sequence occurring within the first sequence, the second sequence also causing in the transponder frequency shifts of F_1 and F_2, respectively, of the signal;

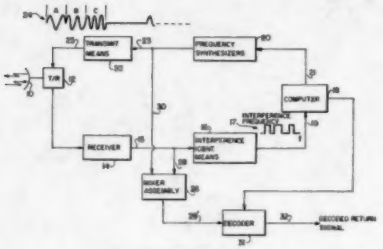
the operating range of the system including the volume defined by the distance accuracies d and h peculiar to the aircraft for its independent return, and the exact position of the aircraft in the immediate vicinity of point A being determined, upon the aircraft's return, by at least two measurements of the distance D and the angle β in relation to the aerial base of the transponder.

4,679,048

ADAPTIVE SPREAD SPECTRUM RADAR

Robert W. Brandsetter, Levittown; Jakob Schwarz, Flushing, and Arnold Seidon, Syosset, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 25, 1985, Ser. No. 727,323
Int. Cl.[4] G01S 13/02
U.S. Cl. 342—61 8 Claims



1. An adaptive radar system capable of identifying interference frequencies and changing the system operating frequencies to permit radar operation in interference-free portions of the frequency spectrum, the system comprising:

means for receiving a radar signal;

means connected at its input to the receiving means output for identifying those frequencies where interference exists;

computing means connected at its input to the identifying means output for determining and storing data relating to non-interference frequencies;

synthesizer means driven by the computing means for generating synthesized signals at the non-interference frequencies; and

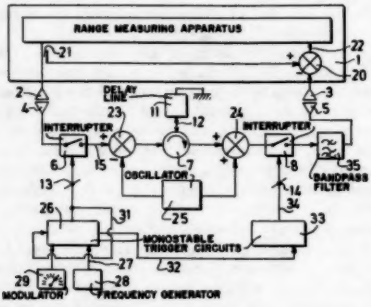
means connected between the output of the frequency synthesizer and an antenna for generating a transmitted signal at an effective frequency band composed of juxtaposed frequency bands straddling identified interference bands synthesizing a single broad band frequency range sufficient to handle a transmitted signal.

4,679,049

DELAY SIMULATOR FOR FM-CW RANGE MEASURING APPARATUS

Michel M. R. Riffiod, Fontenay Aux Roses, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1985, Ser. No. 795,962
Claims priority, application France, Nov. 13, 1984, 84 17271
Int. Cl.[4] G01S 7/40
U.S. Cl. 342—172 4 Claims



1. A delay simulator for a FM-CW range measuring apparatus, said apparatus effecting, during real time operation, a frequency comparison between a transmitted wave and a wave received after reflection from a target or retransmission by a responder, in such manner as to generate a beat signal Fb at the frequency fb, said simulator being intended for connection to said apparatus for testing its proper operation, characterized in that it comprises, arranged between a transmission portion and a receiving portion, a signal processing link including a first interruptor for very high frequencies, a circulator and a second interruptor for very high frequencies, said link further including:

(a) a delay line electrically connected to the circulator and operating in the reflecting mode for delaying the wave at a given frequency by a time equal to τ; and

(b) control means for said interruptors effecting opening thereof at a frequency fr at least equal to 2fb, the first interruptor being opened during a time interval δ distinctly less than 1fr, and the second interruptor being opened during a time interval δ', the phase shift of the predetermined operations between the two interruptors corresponding to a controllable time interval τ' between the beginning of the time intervals δ and δ', said interval τ' being such that the time intervals δ and δ' are separated and that at least an echo of the order P of the delay line is defined by the equation:

$$p \cdot \tau = k/fr + \tau'$$

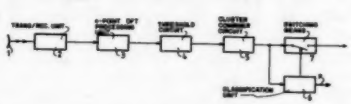
where k is a small integer.

4,679,050

PULSE RADAR APPARATUS

Jan Bergman, Haaksbergen, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Nov. 25, 1985, Ser. No. 801,367
Claims priority, application Netherlands, Dec. 11, 1984, 8403758
Int. Cl.[4] G01J 13/00
U.S. Cl. 342—196 2 Claims



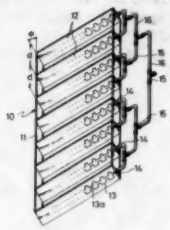
1. Pulse radar apparatus provided a transmitting and receiving unit, whereby the received target echoes are sampled and digitised after detection; an n-point DFT processing unit; a threshold circuit; and a cluster combiner circuit comprising means for combining radar cells, collectively covering one single target, to form a cluster from the signals obtained from the threshold circuit, for determining a signal representing the target covered by the cluster and hence the target range and azimuth, characterised in that: the pulse repetition period of the radar apparatus contains m wobbles; the cluster combiner circuit comprises means for determining the magnitude of the local maximum values present in the DFT spectrum covered by the target-representing signal, as well as an indication which of the DFT processor output channels produces said maximum values; a classification unit connected to the cluster combiner circuit is incorporated for defining a target as being a k-time-around target subject to the conditions that: for the target-representing signals produced by the cluster combiner circuit the difference in the cluster-defined target ranges correspond or substantially correspond with a particular wobble period; the difference in azimuth of the clusters is within predefined narrow limits; the magnitudes of said local maximum values of the DFT spectra are equal or substantially equal to each other; and said local maximum values are present in either the same DFT processor output channel or output channels differing in frequency from each other a value of $(k/m)_n$ times the bandwidth of the output channels concerned, where $k=1, 2, \ldots, m-1$.

4,679,051

MICROWAVE PLANE ANTENNA

Yasuo Yabu, Hirakata; Toshio Abiko, Ibaragi, and Masayuki Matsuo, Kobe, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 22, 1985, Ser. No. 790,241
Claims priority, application Japan, Nov. 1, 1984, 59-230875; Dec. 19, 1984, 59-269299
Int. Cl.[4] H01Q 1/00
U.S. Cl. 343—700 MS 7 Claims



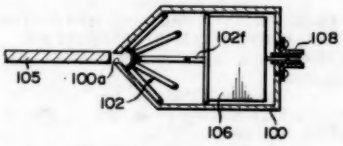
1. A microwave plane antenna comprising antenna bodies respectively of a dielectric material and carrying thereon at least a pair of substantially parallel microstrip lines cranked at mutually staggered positions, a frame for supporting two or more of said antenna bodies, a power supply circuit branched and connected to one end of each of said pairs of said microstrip lines for their tournament connection, and means for adjustably positioning the antenna bodies relative to said supporting frame by shifting the respective antenna bodies in a plane including a first axis vertical to a plane of the antenna body and a second axis in the width direction of the pair of the microstrip lines.

4,679,052

AUTOMOBILE ANTENNA DEVICE

Junzo Ohe, and Hiroshi Kondo, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 26, 1985, Ser. No. 801,771
Claims priority, application Japan, Nov. 27, 1984, 59-251244
Int. Cl.[4] H01Q 1/32
U.S. Cl. 343—712 7 Claims



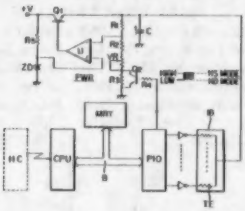
1. An automobile antenna device comprising:
an electrostatic shield case having an opening to face to a metal plate of the automobile body; and
a loop antenna being internally arranged in said electrostatic shield case so that said loop antenna can be facingly provided to said opening in its close vicinity,
in order to detect the surface current induced in the surface of the automobile body by broadcasted waves,
wherein said loop antenna is equipped with a plurality of loops which are respectively formed by wound antenna wires, and said respective loops are sectorially arranged with one side portions thereof are concentrated in the vicinity of the opening and the other side portions thereof are separately disposed in an approximately same distance.

4,679,053

THERMAL VARIABLE VELOCITY PRINTER SYSTEM

Junji Katsurai, Hachioji; Masao Monma, Kanagawa, and Tetsuo Takaku, Tsurugashima, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 682,265, Dec. 17, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 806,119
Claims priority, application Japan, Dec. 29, 1983, 58-249904
Int. Cl.[4] G01D 15/10; B41J 3/20
U.S. Cl. 346—1.1 13 Claims



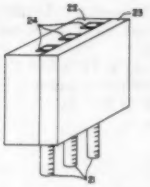
1. In a method of recording with a thermal printer having a thermal head having heating elements, wherein a printing is performed by selectively driving said heating elements, said method of recording comprising:
generating a driving electric power signal and selectively applying said power signal to said heating elements;
selectively setting one of at least two given recording character modes, each of which sets a given different recording speed; and
controlling at least the pulse amplitude of said driving electric power signal applied to said heating elements of said thermal head in accordance with said set recording character mode while keeping the pulse cycle of said driving electric power signal at a predetermined substantially constant period, said pulse amplitude having a higher value when recording at a higher speed and a lower value when recording at a lower speed.

4,679,054

PRINT HEAD

Yoshitaka Yoshikawa, Hirakata; Masahide Tsukamoto, Nara; Yutaka Nishimura, Kadoma; Hitoshi Ono, Hirakata, and Tetsuhiro Sano, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 654,244, Sep. 25, 1984. This application Jul. 9, 1986, Ser. No. 883,017
Claims priority, application Japan, Sep. 27, 1983, 58-178537; Sep. 27, 1983, 58-178536; Sep. 29, 1983, 58-182126
Int. Cl.[4] G01D 15/06
U.S. Cl. 346—76 PH 16 Claims



1. A print head for printing on a printing medium an image corresponding to an electric signal, comprising:
elongated electrical conductors to which said electric signal is applied; and
fixing means for fixing said electrical conductors so that one end of each of said electrical conductors is exposed at a

surface of said fixing means to be in contact with said printing medium.

wherein said fixing means is made of a sintered body containing hexagonal boron nitride so that both of said surface of said fixing means and said end of each of said electrical conductors are worn during printing, thereby keeping said end of each of said electrical conductors in contact with said printing medium.

4,679,055

METHOD AND APPARATUS FOR THERMAL HALF-TONE PRINTING

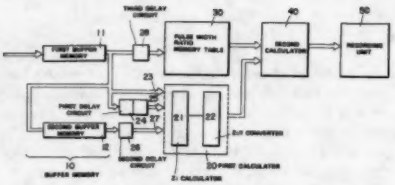
Toshiharu Inui, and Haruhiko Moriguchi, both of Ebina, Japan, assignors to Fuji Xerox, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 634,707, Jul. 26, 1984, abandoned. This application Mar. 31, 1986, Ser. No. 846,515

Claims priority, application Japan, Jul. 28, 1983, 58-138362

Int. Cl.[4] G01D *15/10*

U.S. Cl. 46—76 PH **8 Claims**



1. A method of thermal half tone printing of picture elements in lines wherein each picture element is made up of a plurality of dots, and the number of printed dots in said picture element and the size or brightness of respective printed dots are varied in accordance with a tone of a picture element to be printed so as to represent a half tone image, the method comprising the steps of:

determining printing energy ratios between respective dots in said picture element in accordance with respective tones;

calculating a heat accumulation state of the heat generating members corresponding to a picture element to be printed in accordance with at least the tones of picture element in the neighborhood of and in the same lines as said pictue element to be printed, and

controlling the printing energy supplied to said heat generating members corresponding to respective dots of said picture element to be printed in accordance with both said printing energy ratio and said calculated heat accumulation state.

4,679,056

THERMAL HEAD WITH INVERTIBLE HEATING RESISTORS

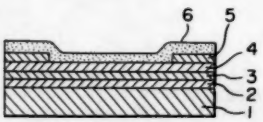
Mikiya Kobayashi, Sagamihara; Takeshi Nakada, Chiba, and Michio Arai, Koganei, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,290

Claims priority, application Japan, Oct. 4, 1984, 59-207097

Int. Cl.[4] G01D *15/10*; H01C *7/10*; H05B *1/02*

U.S. Cl. 346—76 PH **4 Claims**



1. A thermal head comprising heating resistors with their temperature coefficient of resistance being negative at normal temperature and invertible to be positive as the temperature rises, wherein the temperature coefficient of resistance of the heating resistors is from −500 to 0 ppm/° C. for 25°–150° C. and from 100 to 500 ppm/° C. for 25°–300° C., as represented by the average temperature coefficient of resistance.

4,679,057

LASER RECORDING APPARATUS

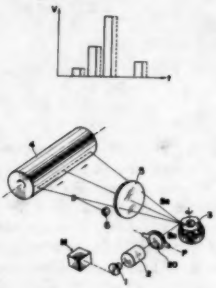
Akiyoshi Hamada, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 20, 1985, Ser. No. 799,916

Claims priority, application Japan, Nov. 22, 1984, 59-247278; Nov. 22, 1984, 59-247279

Int. Cl.[4] G01D *15/14*; H04N *1/21*

U.S. Cl. 346—76 L **16 Claims**



1. A laser recording apparatus being adapted to modulate a laser beam by a multi-tone image signal and to scan the beam across a recording medium, said apparatus comprising;

a laser light source,

first means for producing a first pulse signal modulated in amplitude in accordance with the image signal,

second means for producing a second pulse signal modulated in pulse width in accordance with the image signal,

means for composing the first and second pulse signals to produce a pulse signal modulated in amplitude and width,

means for modulating the laser beam in response to the pulse signal from the composing means, and

means for scanning the beam across the recording medium.

4,679,058

CASSETTE-TYPE PRINTING HEAD WITH PERFORATED FILM MEMBER

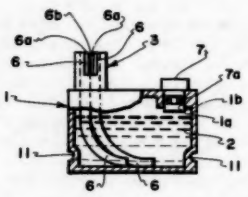
Keiichi Hori, Tokyo, Japan, assignor to Elm Company Ltd., Tokyo, Japan

Filed May 7, 1985, Ser. No. 732,179

Claims priority, application Japan, May 22, 1984, 59-101845; Jun. 6, 1984, 59-114685

Int. Cl.[4] G01D *15/16, 15/10*; B41J *31/14*

U.S. Cl. 346—140 R **11 Claims**



1. A cassette-type printing head comprising in combination:

a fluid ink; at least one cassette body having a cavity for housing said ink; at least one ink guiding member in which one end thereof is immersed in said cavity containing said ink; and a film member having a plurality of through openings for at least temporarily capturing said ink, said film member being slidably contacted by said ink guiding member; and, a thermal head having a plurality of elements cooperatively associated with said film member, with several of said through openings of said film member alignable with each of said thermal head elements for heating said temporarily captured ink in said through openings and jetting said ink into a sheet material.

4,679,059

HIGH SPEED INK JET PRINTER WITH IMPROVED ELECTRICAL CONNECTION TO THE NOZZLES

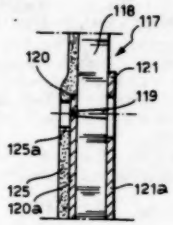
Giandomenico Dagna, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Division of Ser. No. 631,950, Jul. 18, 1984. This application Mar. 10, 1986, Ser. No. 838,167

Claims priority, application Italy, Jul. 20, 1983, 67783 A/83

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **8 Claims**



1. An ink jet printer including a reservoir made of insulating material for an electrically conductive ink, a common electrode in contact with ink in said reservoir, a plate member defining a wall portion of said reservoir, said plate member comprising a laminar substrate of rigid electrically insulating material and a plurality of metal coatings on the outer surface of the substrate, a coating of vitreous material on the outer surface of said substrate and over said plurality of metal coatings, a plurality of capillary nozzles associated with said metal coatings and formed as holes each of which passes through said substrate, one of said metal coatings and said vitreous coating, said metal coatings forming individual electrodes associated with said nozzles, and a pulse generating circuit for selectively generating voltage pulses applied between the common electrode and the individual electrodes for causing the ejection of ink droplets through the associated nozzles, wherein the improvement includes: each of said plurality of metal coatings on said outer surface extending to an edge of said substrate, an additional metal coating on the inner surface of said substrate to form said common electrode and having a portion extended to an edge of said substrate to define an edge portion, and a plurality of additional metal coating portions at the edge of said substrate to define edge portions and individually electrically connected with the metal coatings of said outer surface, said edge portion of said additional coating forming said common electrode and the edge portions connected to said metal coatings being electrically connected to said pulse generating circuit.

4,679,060

IONIC PRINT CARTRIDGE AND PRINTER

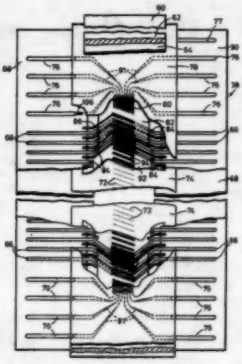
Robert S. McCallum, R.R. #1, Terra Cotta, Ontario, Canada L0P 1N0; Paul E. Plasschaert, R.R. #1, Limehouse, Ontario, Canada L0P 1H0; Dolf Landheer, 26 Euclid Avenue, Ottawa, Ontario, Canada K1S 2W3, and Hemant M. Gandhi, #12, 60 Wasdale Crescent, Toronto, Ontario, Canada M6A 1W8

Filed Nov. 28, 1984, Ser. No. 675,664

Claims priority, application Canada, Dec. 9, 1983, 442946

Int. Cl.[4] G01D *15/06*

U.S. Cl. 346—159 **8 Claims**



1. An ionographic print cartridge for use in placing discrete dots of electrostatic charge on a drum to build a latent image for subsequent toning, the print cartridge comprising:

a substrate of a dielectric material having sufficient rigidity to resist deformation during assembly;

driver electrodes printed on the substrate and consisting of parallel conductors extending longitudinally and lead portions terminating at the conductors and extending generally transversely from ends of the conductors for making electrical connections to the driver electrodes;

a dielectric layer covering at least the conductors so that the conductors are at a first side of the layer;

finger electrodes at the opposite side of the dielectric layer, the finger electrodes defining edge structures straddling the driver electrodes and having individual contacts to the sides of the driver electrodes for making electrical connections to the finger electrodes.

4,679,061

SUPERLATTICE PHOTOCONDUCTOR

Federico Capasso, Westfield; Alfred Y. Cho, Summit; Albert L. Hutchinson, Piscataway, and Khalid Mohammed, North Plainfield, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 14, 1985, Ser. No. 745,277

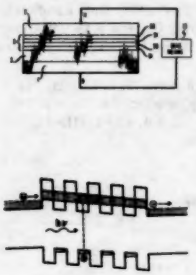
Int. Cl.[4] H01L *27/12*

U.S. Cl. 357—4 **6 Claims**

1. A photoconductive device comprising:

a superlattice having interleaved well and barrier layers, said

superlattice having differential conductivity for electrons and holes, said barrier layers having a first bandgap;



first and second semiconductor layer disposed on opposite sides of said superlattice, at least one of said layers being heavily doped.

4,679,062

THIN FILM TRANSISTOR

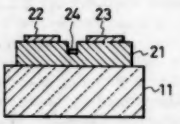
Kotaro Okamoto, Hino, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Dec. 16, 1985, Ser. No. 809,677

Claims priority, application Japan, Dec. 28, 1984, 59-279986

Int. Cl.[4] H01L *29/80*

U.S. Cl. 357—22 **7 Claims**



1. A thin film transistor comprising:

a substrate;

an impurity-doped hydrogenated amorphous silicon semiconductor layer formed on the substrate;

a source and drain electrode formed apart from one another on the amorphous silicon semiconductor layer in ohmic contact therewith;

a gate electrode formed on the amorphous silicon semiconductor layer in Schottky contact therewith between the source and drain electrodes, the portion of said amorphous silicon semiconductor layer underlying the gate electrode being 0.1 to 1.0 μm thick; and

an impurity-undoped amorphous silicon semiconductor layer interposed between the impurity-doped amorphous silicon semiconductor layer and the substrate.

4,679,063

INFRA RED DETECTORS

Anthony M. White, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 22, 1983, Ser. No. 534,692

Claims priority, application United Kingdom, Sep. 23, 1982, 8227180

Int. Cl.[4] H01L *27/14*

U.S. Cl. 357—30 **15 Claims**

1. An infrared photoconductive detector comprising:

(1) an n-tpe semiconducting emitter region of infrared photosensitive material;

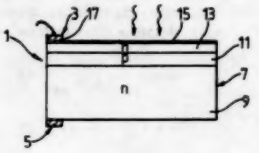
(2) a collector region, the emitter and collector region materials being of the same majority carrier type;

(3) emitter and collector contacts; and

(4) a barrier region connecting the emitter and collector regions, said barrier region:

(a) comprising p-type semiconductor material,

(b) having a valence band substantially common with the emitter material valence band,



(c) having a wider band gap than the emitter material and providing a heterostructure conduction band discontinuity with the emitter region, and

(d) being arranged such that electron flow between the emitter and collector regions is impeded while corresponding hole flow is substantially unimpeded.

4,679,064

CIRCUIT FOR CHANGEABLE PROLONGATION OF THE RUNNING TIME OF AN ULTRASOUND DELAY LINE

Heinz Hess, Weiterstadt, and Horst Peth, Alsbach-Hähnlein, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

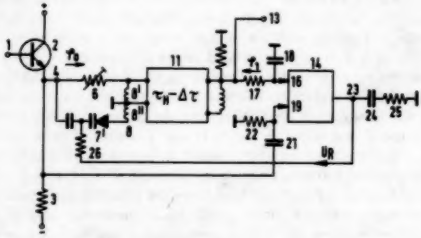
PCT No. PCT/DE85/00067, § 371 Date Jul. 18, 1985, § 102(e) Date Jul. 18, 1985, PCT Pub. No. WO85/04303, PCT Pub. Date Sep. 26, 1985

PCT Filed Mar. 4, 1985, Ser. No. 765,433

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1984, 3408821

Int. Cl.[4] H04N *9/66*

U.S. Cl. 358—24 **5 Claims**



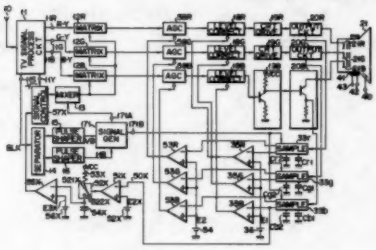
1. Circuit for a changeable prolongation of the (phase-) running time of an ultrasound delay line with a delay duration of somewhat less than a line duration for color television signals in the range of the color carrier frequency, comprising a source of a signal to be processed, a changeable resistor which is connected between said source and a first input of the ultrasound delay line; a coil which is disposed between the first input and a second input of the delay line, said second input being connected to a reference potential; the coil being a first winding (8') of a transformer, (8), said transformer having a second winding (8'') connected at one end thereof to the reference potential and, at the other end thereof, through a changeable capacity (7) to a connection point of the changeable resistor (6) and the signal source.

4,679,065

AUTOMATIC WHITE CONTROL CIRCUIT FOR COLOR TELEVISION RECEIVER

Toshimitsu Umezawa, Kazo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 9, 1984, Ser. No. 628,985
Claims priority, application Japan, Jul. 11, 1983, 58-124608
Int. Cl.[4] H04N 9/64, 9/20, 9/16
U.S. Cl. 358—29 7 Claims

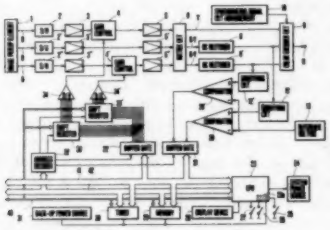


4,679,066

COLOR IMAGE PICKUP DEVICE

Makoto Masunaga; Tomotaka Muramoto, both of Tokyo, and Kenichi Nagasawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 501,985, Jun. 7, 1983, abandoned. This application Oct. 30, 1986, Ser. No. 926,807
Claims priority, application Japan, Jun. 9, 1982, 57-99851; Jun. 9, 1982, 57-99852; Jun. 9, 1982, 57-99860; Mar. 29, 1983, 58-53009; Mar. 29, 1983, 58-53010
Int. Cl.[4] H04N 9/73
U.S. Cl. 358—29 27 Claims



1. A color image pickup system comprising:

image pickup means for obtaining a color video signal from an optical image;

hue adjusting means for adjusting the hue of the color video signal produced by said image pickup means;

first memory means for determining the state of said hue adjusting means according to data stored therein;

control means for varying the data stored in said first memory means by utilizing the output of said image pickup means;

second memory means for storing the data of said first memory means; and

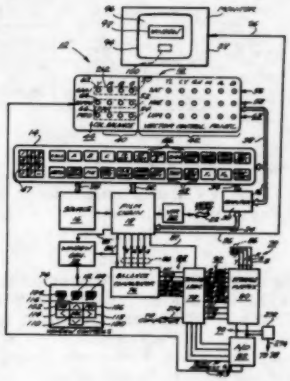
further including judging means for judging the validity of data stored in said second memory means.

4,679,067

COLOR CORRECTION SYSTEM AND METHOD WITH LOCALIZED COLOR SAMPLING

Armand Belmares-Sarabia, Oak Beach, N.Y., and Stanley J. Chayka, Parsippany, N.J., assignors to Corporate Communications Consultants, Inc., Fairfield, N.J.

Filed Apr. 9, 1984, Ser. No. 598,468
Int. Cl.[4] H04N 9/73
U.S. Cl. 358—29 19 Claims



1. Apparatus for color-correcting video picture signals having red, green, and blue color component signals and a luminance signal, said apparatus comprising, in combination, display means for displaying on a video monitor screen a picture composed of said video picture signals, means for detecting the color characteristics of selected ones of said signals, selecting means for selecting the ones of said video picture signals for which said color characteristics are detected as those which create picture elements within a predetermined area which is less than the area of the entire picture, means for selectively moving and locating said predetermined area within said picture, said means for selectively moving and locating including means for selectively changing the size and position of sid predetermined area, and automatic color balancing means for automatically developing color balance signals for said selected picture signals, said automatic color balancing means including means for comparing each of said red, green, and blue color signals with said luminance signal, and means for adjusting each of said red, green, and blue color signals to attain a predetermined relationship with said luminance signal.

4,679,068

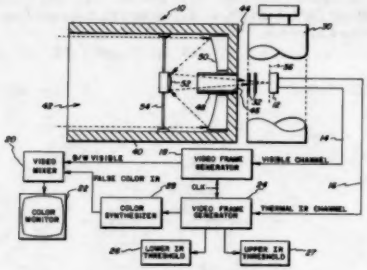
COMPOSITE VISIBLE/THERMAL-INFRARED IMAGING SYSTEM

Robert D. Lillquist; Joseph M. Pimbley, and Thomas L. Vogelsong, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 25, 1985, Ser. No. 758,981
Int. Cl.[4] H04N 5/33, 9/07; H01L 25/00
U.S. Cl. 358—44 25 Claims

1. Multispectral imaging apparatus comprising a wavelength-independent focus reflective optical system for receiving visible and infrared radiation from a scene and for focusing the visible and infrared radiation at a common focal plane; detector means responsive to both the visible and the infrared radiation focused at the common focal plane, the detector means providing first and second signals representative, respectively, of the visible and the infrared radiation received by the detector means; and means responsive to the first and second signals for displaying a composite image of the scene,

the composite image comprising a black and white visual image of the scene with portions of the image highlighted in



color in accordance with the infrared radiation received from corresponding portions of the scene.

4,679,069

COLOR PICTURE PROJECTION SYSTEM WITH A WAVELENGTH-SELECTIVE REFLECTOR FOR FILTERING OUT UNDESIRED LIGHT FROM A MONOCHROME PICTURE DISPLAY SOURCE

Johan Andrea, Eindhoven, Netherlands; Eugene Lubchenko, Knoxville, and Ralph H. Bradley, Kingsport, both of Tenn., assignors to NAP Consumer Electronics Corp. and U.S. Philips Corporation, both of New York, N.Y.

Filed Jul. 13, 1984, Ser. No. 630,629

Int. Cl.[4] H04N *9/31, 9/16;* G03B *21/26, 21/28*

U.S. Cl. 358—60 **11 Claims**

1. A color picture projection system comprising:

means for displaying a color picture consitituted by a first, a second and a third monochrome picture superimposed upon one another;

first, second and third monochrome picture display means for generating, respectively, a first, a second and a third monochrome picture comprising, respectively, a first, a second and a third band of desired wavelengths;

a first, a second and a third projection lens system arranged between said color picture displaying means and, respectively, said first, second and third monochrome picture display means, for projecting, respectively, said first, second and third monochrome pictures along, respectively, a first, a second and a third light path towards said color picture displaying means; and

first and second optical means arranged between said color picture displaying means and said first and second monochrome picture display means, respectively, for, respectively, folding said first light path and said second light path, said first optical means comprising wavelength-selective reflector means external to said second and third light paths for reflecting only wavelengths within said first band of desired wavelengths towards said color picture displaying means.

4,679,070

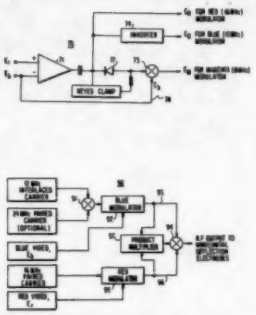
METHOD AND APPARATUS FOR ENHANCING MAGENTA MODULATION OF A LIGHT VALVE PROJECTOR

Thomas T. True, Camillus, N.Y., assignor to General Electric Company, Princeton, N.J.

Filed Jan. 6, 1986, Ser. No. 816,510

Int. Cl.[4] H04N *9/31*

U.S. Cl. 358—62 **10 Claims**



1. An improved modulator control circuit for enhancing magenta modulation of a light valve projector having an input bar plate having slots, an electron gun including deflection means, a deformable light modulating medium and an output bar plate having slots comprising in combination:

means for generating a first control signal for red and a second control signal for blue;

means for determining the larger of said first and second control signals or if said first and second control signals are equal;

means for generating a third control signal for magenta equal to the smaller of said first and second control signals or to said first and second control signals if said first and second control signals are equal; and

means for modulating said light modulating medium with an electron beam produced by said electron gun in accordance with said first, second and third control signals.

7. A method of enhancing magenta modulation of a light valve projector having an input bar plate having slots, an electron gun including deflection means, a deformable light modulating medium and an output bar plate having slots comprising the steps of:

generating first, second and third carrier signals having a frequency relationship of four-to-three-to-six, respectively;

modulating said first carrier signal with a red video signal to produce a first modulated signal;

summing said second and third carrier signals to produce a first summed signal;

modulating said first summed signal with a blue video signal to produce a second modulated signal; and

summing said first and second modulated signals to produce a second summed signal for controlling the deflection of an electron beam impinging on said light modulating medium whereby a beat frequency which is the difference between the frequencies of said first and third carrier signals is produced in said light modulating medium.

4,679,071

METHOD OF RECORDING REGISTER MARKS

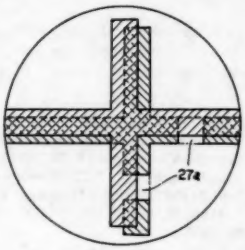
Osamu Kitagawa, Osaka, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Japan

Division of Ser. No. 723,940, Apr. 16, 1985. This application Oct. 15, 1986, Ser. No. 919,254

Claims priority, application Japan, Apr. 27, 1984, 59-87214; May 31, 1984, 59-112674

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—75 3 Claims



1. A method of recording the register marks in a color scanner, the method comprising:

a first step of producing a first group of picture signals in the cross direction parallel with the subscanning direction, and a second group of picture signals in the grain direction parallel with the main scanning direction, with the use of timing pulses;

a second step of producing positive linear picture signals by combining the first and second groups of signals;

a third step of recording by exposure register marks outside the reproducing picture area for the respective color separation picture, the area being hereinafter referred to as the blank area, by using the positive linear picture signals as register mark signals; and

a fourth step of producing the register mark recording signals by dividing the positive linear picture signals at a desired timing so as to produce omitted portions therein.

4,679,072

COLOR ADJUSTING DEVICE

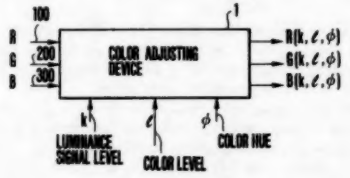
Makoto Takayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha

Filed Dec. 13, 1985, Ser. No. 808,868

Claims priority, application Japan, Dec. 20, 1984, 59-269883

Int. Cl.[4] H04N *1/46, 9/77*

U.S. Cl. 358—80 12 Claims



1. A color adjusting device comprising:

(a) a plurality of channel means for inputting a plurality of chrominance signal informations;

(b) memory means for transforming the levels of said plurality of chrominance signal informations coming in through said plurality of channel means based on respective different functions from one another, whereby said functions of said memory means are expressed by linear equations whose terms include trigonometrical functions.

4,679,073

COLOR IMAGE READING APPARATUS WITH WHITE BALANCE SYSTEM FOR CONTROLLING THE INTENSITY OF A LIGHT SOURCE ILLUMINATING A COLOR DOCUMENT

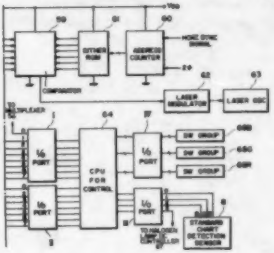
Kimiyoshi Hayashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

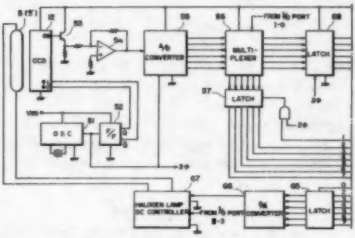
Filed Oct. 21, 1983, Ser. No. 544,240

Claims priority, application Japan, Oct. 27, 1982, 57-188815

Int. Cl.[4] G03F *3/08;* H04N *1/46, 9/73*

U.S. Cl. 358—80 9 Claims





1. A color image reading apparatus comprising:

a light source, the intensity of light produced thereby varying in accordance with the amount of power supplied thereto;

reading means for photoelectrically reading a color document illuminated by said light source a plurality of times and for generating a plurality of color component signals representing the color document a different one of said plurality of color component signals being generated during each reading of said color document;

a reference area which can be illuminated by said light source;

means for causing said reading means to read said reference area illuminated by said light source prior to reading the color document to generate a plurality of reference color component signals; and

means for controlling the amount of power supplied to said light source during each reading of said color document by said reading means in accordance with the plurality of reference color component signals generated by said reading means.

4,679,074

COLOR IMAGE PROCESSING APPARATUS WITH A PLURALITY OF ADDRESSABLE CHARACTERISTIC CONVERSION TABLES FOR COMPENSATING FOR DIFFERENCES IN THE SPECTRAL CHARACTERISTICS OF DIFFERENT INPUT DEVICES

Susumu Sugiura, Yamato; Takashi Sugino, Kawasaki, and Naoya Hirose, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,464

Claims priority, application Japan, Mar. 17, 1983, 58-44988

Int. Cl.[4] G03F *3/08;* H04N *1/46, 5/202, 9/69*

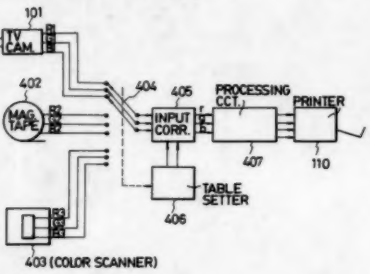
U.S. Cl. 358—80 14 Claims

1. A color image signal processing apparatus, comprising:

input means for receiving a color image signal connectable to plural kinds of color input devices, wherein said input devices may have different spectral characteristics;

conversion means for converting characteristics of the color image signal received by said input means according to one of a plurality of predetermined conversion tables, said one conversion table being addressed by the color image signal received by said input means and outputting a processed color image signal;

switching means for selecting said one conversion table of said conversion means according to the kind of color input device connected to said input means;



output means for receiving the processed color image signal, said output means being common to said plural kinds of input devices; and

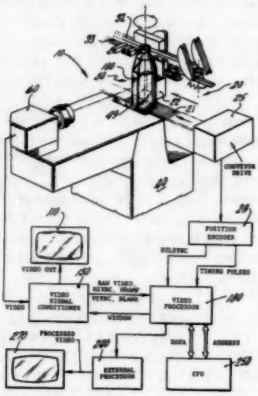
processing means for receiving the processed color image signal outputted from said one conversion table and providing the processed color image signal to said common output means.

4,679,075

GLASSWARE INSPECTION USING OPTICAL STREAK DETECTION

Reade Williams, South Hamilton, and Kenneth P. Westlund, Danvers, both of Mass., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Apr. 29, 1985, Ser. No. 728,054
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—106 **24 Claims**



1. A method for inspecting articles for manufacturing defects, said method comprising the steps of:

illuminating an article to be inspected;

optically scanning a portion of the article with an optical scanner during an inspection interval while causing relative motion between the article and the optical scanner, said optical scanner comprising a matrix of video elements arranged in rows and columns, and said relative motion being great enough to cause said optical scanner to register a streaked image;

deriving a series of chronologically sequential frames from said optical scanner corresponding to output signals of the matrix of video elements, and

for each of a plurality of linear portions of each frame, summing the output signals of the corresponding video elements to identify an image streak registered in at least one of said linear portions representing a defect in the article.

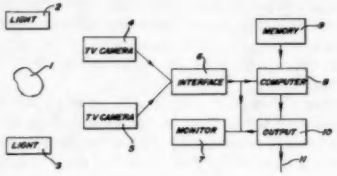
comparing said line sum signal arrays with a predetermined defect standard to determine any row or rows of the arrays which signifies the presence of a defect in the article.

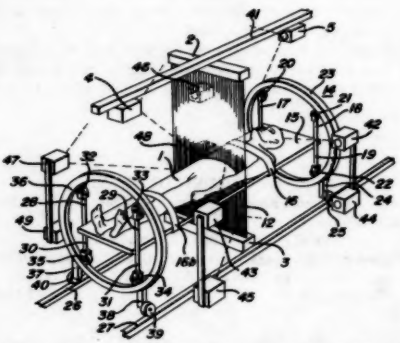
4,679,076

MEANS FOR REGISTERING COORDINATES

Karl-Johan Vikterlöf, Vårbovägen 14, 702 30 Örebro, and Göte Palsgard, Eklundavägen 34 A, 702 17 Örebro, both of Sweden

PCT No. PCT/SE84/00206, § 371 Date Feb. 8, 1985, § 102(e) Date Feb. 8, 1985, PCT Pub. No. WO84/04876, PCT Pub. Date Dec. 20, 1984
PCT Filed May 30, 1984, Ser. No. 711,577
Claims priority, application Sweden, Jun. 8, 1983, 8303224
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—107 **10 Claims**





1. Apparatus for determining the coordinates relative to a predetermined reference system at one or more points on the external or internal contour of a body, which body may be a human body, comprising in combination:

(a) slot light source means (2,3) for generating a light curtain (12) forming a circumferential line around a body (1) whose coordinates are to be determined.

(b) support means (14) for orienting and positioning the body (1) relative to a predetermined reference system;

(c) video means (4) for detecting sequentially from at least one direction a plurality of circumferential lines along a given axis of the body (1) as the body (1) and video means (4) are moved relative to one another by the support means and producing a series of signals; and

(d) computer means (8,9) connected to the video means (4) for receiving the series of signals and determining and storing coordinates for points along each circumferential line detected.

4,679,077

VISUAL IMAGE SENSOR SYSTEM

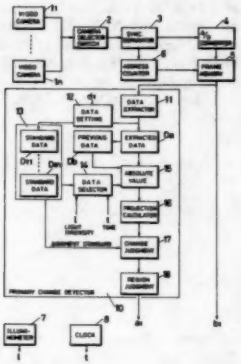
Hiroyoshi Yuasa, Hirakata; Akira Yasuda, Neyagawa, and Koichi Omura, Osaka, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

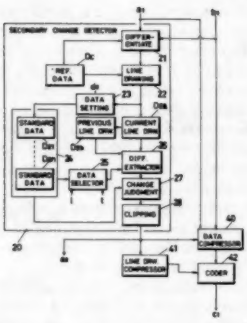
Filed Nov. 1, 1985, Ser. No. 794,228

Claims priority, application Japan, Nov. 10, 1984, 59-237211; Nov. 10, 1984, 59-237212; Nov. 10, 1984, 59-237213; Dec. 19, 1984, 59-269298; Jan. 25, 1985, 60-12768; Mar. 25, 1985, 60-60012; May 29, 1985, 60-116229; May 29, 1985, 60-116230; May 29, 1985, 60-116231; Jun. 25, 1985, 60-138508; Jun. 25, 1985, 60-138510; Jun. 25, 1985, 60-138519

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—108 45 Claims





1. A visual image sensor system comprising:

means for monitoring a given region and generating monitored picture data,

means for memorizing a plurality of standard picture data including normal changes of the monitored picture data,

means for memorizing one or more selection standards for selecting standard picture data to be compared with said monitored picture data,

means for memorizing one or more judgment standards to judge existence of a picture change by said comparison, and

means for comparing the monitored picture data with all the standard picture data that are selected on said selection standards and for issuing an alarm when a changed amount detected by said comparison is greater than said judgment standards.

4,679,078

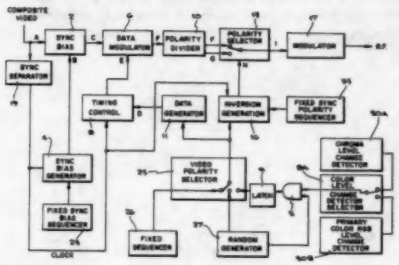
HIGH SECURITY SUBSCRIPTION TELEVISION TRANSMISSION SYSTEM

Hoi W. Wong, Kowloon, and Hung Y. Chai, Taikoo Shing, both of Hong Kong, assignors to Luks Industrial Company Ltd., Hong Kong

Continuation-in-part of Ser. No. 552,077, Nov. 15, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,882

Int. Cl.[4] H04N 7/167

U.S. Cl. 380—15 12 Claims



1. A system for dynamically scrambling and descrambling a composite video signal having video program information and horizontal sync and blanking signals, comprising:

bias means for selectively DC biasing said sync and blanking signals according to a first predefined fixed sequence, and for imposing, at the locations of said biased sync and blanking signals, a synthetic sync signal;

information modulating means for modulating said synthetic sync signal with binary information identifying the inversion sequence of video signal;

inversion means for selectively inverting, according either a second predefined fixed sequence or a random sequence, selected portions of said video program informations, said horizontal sync signals, said horizontal blanking signals, and said synthetic sync signals in said encoded video signal to produce a scrambled encoded video signal;

information detecting means for detecting said encoded information in said scrambled encoded video signal to identify said inversion sequence of video signal;

reinversion means for selectively reinverting, according to said first and second predefined sequences, the inverted portions of said video program information, said horizontal sync signals, said horizontal blanking signals, and said synthetic sync signals in said scrambled encoded video signal to produce an unscrambled encoded video signal; and

restoration means for removing said synthetic sync signals from said encoded video signal and to restore said biased sync and blanking signals, whereupon said composite video signal is restablished.

4,679,079

METHOD AND SYSTEM FOR BIT-RATE COMPRESSION OF DIGITAL DATA TRANSMITTED BETWEEN A TELEVISION TRANSMITTER AND A TELEVISION RECEIVER

Jean-Yves Catros, Rennes, and Denis Michler, Acigne, both of France, assignors to Thomson Video Equipment, Gennevilliers, France

Filed Mar. 29, 1985, Ser. No. 717,884

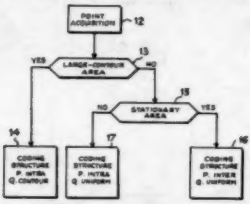
Claims priority, application France, Apr. 3, 1984, 84 05330

Int. Cl.[4] N04N 7/12

U.S. Cl. 358—135 10 Claims

1. A method of bit-rate compression of digital data transmitted between at least one television transmitter and a televison receiver, the data being representative of the values of luminance and/or of chrominance of each point of a television

image and being coded at the transmitter by means of a differential coding device of the type comprising at least one predictor, at least one quantizer, a device for reconstruction of the transmitter data and a code allocator, said data being decoded at the receiver by a differential decoder comprising at least one code converter, a predictor and a device for reconstruction of the transmitted data, wherein said method comprises coding the data relating to each current point to be transmitted by means of a first predictor and a first quantizer when the point belongs to a contour area, coding the data relating to each point of a uniform or slightly textured area by means of at least a second predictor and a second quantizer, and decoding each received data code at the receiver by means by a prediction



characteristic providing a prediction value which is identical with the value previously computed at the transmitter for decoding the received data code, in comparing the prediction errors of each predictior of the transmitter and of the receiver with at least one predetermined error threshold value in order to code the current point data at the transmitter by means of different code words of fixed length, depending on whether the results of comparisons of the errors of prediction of the points adjacent to the current point already transmitted to the receiver indicate that the point is in a contour area or in a uniform area and in order to switch the receiver to a predictor which has the same prediction dharacteristic as the predictor employed earlier for coding the current point data at the transmitter.

4,679,080

FIELD BLANKING PULSE MODIFIER

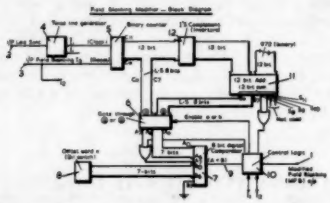
Dennis J. Bashford, and Geoffrey H. Blackham, both of Horsham, England, assignors to Rediffusion Simulation Limited, England

Filed Sep. 6, 1985, Ser. No. 773,249

Claims priority, application United Kingdom, Sep. 6, 1984, 8422548

Int. Cl.[4] H04N *5/06*

U.S. Cl. 358—150 **2 Claims**



1. A field blanking pulse modifier comprising means for deriving clock pulses from line synchronizing pulses of a conventional television signal, means for deriving a field blanking pulse from the television signal, a counter providing an output count which is reset by the derived field blanking pulse and counts the clock pulses, means for setting an offset count corresponding to half a predetermined difference between the duration of a modified field blanking pulse to be generated and the duration of the derived field blanking pulse, means for initiating the modified field blanking pulse before the derived field blanking pulse when a difference between the counter output count and a predetermined count which is equal to the number of the clock pulses which occur between two successive derived field blanking pulses becomes less than the offset count, and for terminating the modified field blanking pulse after the derived field blanking pulse when the counter output count becomes equal to the offset count, wherein the means for initiating and terminating the modified field blanking pulse comprises a control logic circuit, a comparator for comparing the offset count and the output from a gate to produce a comparator output, and a subtractor receiving the counter output count and the predetermined count, wherein the gate receives the counter output count and the output of the subtractor and is controlled by the control logic circuit to alternately provide as the gate output the two outputs supplied to it, said control logic circuit being responsive to the comparator output to generate the modified field blanking pulse during a period when the gate output is less than the offset count.

4,679,081

SYSTEM FOR CODING VIDEO SIGNAL IN BLOCK UNIT

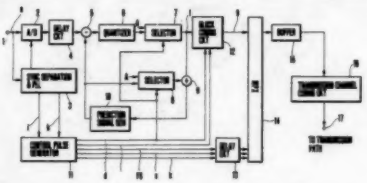
Syuzo Tsugane, and Mitsuo Nishiwaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 796,690

Claims priority, application Japan, Nov. 9, 1984, 59-236226

Int. Cl.[4] H04N *1/40, 7/12*

U.S. Cl. 358—138 **5 Claims**



1. A coding system to divide a frame of a video signal into a plurality of blocks per a predetermined number of lines to encode each area divided into block, said coding device comprising:

synchronization detector means for detecting a frame synchronization signal from said picture signal;

block formation means operative to divide said video signal in block units per said predetermined number of lines by using a picture frame synchronization signal detected by said synchronization detector means as a reference such that when the number of lines included in a block immediately before the subsequent picture frame synchronization signal is less than said predetermined number of lines, said block formation means is operative to designate said block as an ineffective block;

coding means operative to apply a coding processing to the blocks except for said ineffective block designated by said block formation means in accordance with a predetermined coding procedure; and

transmission means operative to multiplex coded data outputted from said block formation coding means, position information of the first block immediately after said picture frame synchronization signal, and the number of lines within said ineffective block to transmit the multiplexed signal thus obtained, whereby when said input video signal is asynchronously switched, an operation is executed to vary the number of lines included within only said ineffective block in the signal picture frame immediately after said switching, thus always maintaining an area to be coded at the rate of said predetermined number of lines.

4,679,082

CODE TRANSMISSION SYSTEM CHARACTER BROADCASTING RECEIVER

Takeshi Shibasaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,520

Claims priority, application Japan, Apr. 27, 1984, 59-86826

Int. Cl.[4] H04N *7/04;* **G06F** *11/00*

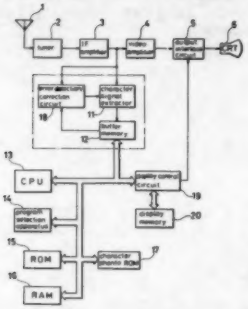
U.S. Cl. 358—147 **2 Claims**

1. A receiver for a code transmission system broadcast signal

transmitted during the vertical blanking period of a television video signal, comprising:

means for extracting a character signal inserted in the video signal;

means for detecting the existence of a code error in the character signal simultaneously with the extraction of said



character signal, and outputting a detection signal corresponding thereto;

buffer memory means for temporarily storing the character signal and detection signal corresponding thereto; and

correction means, responsive to said detection signal, for correcting the code error in said character signal stored in said buffer memory means.

4,679,083

TELETEXT DEVICE WITH REDUCED PAGE-ACCESS TIME

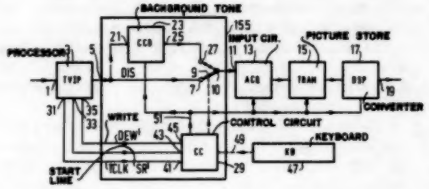
Herman J. R. Schmitz; Marcellinus J. J. C. Annegarn, and Wilhelmus F. Fekkes, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1984, Ser. No. 585,335

Claims priority, application Netherlands, Mar. 2, 1983, 8300764; Apr. 1, 1983, 8301174

Int. Cl.[4] H04N *7/087*

U.S. Cl. 358—147 **17 Claims**



1. An apparatus for generating video text data carried on a television signal during a time interval of each field, said video text data including a plurality of magazines, each magazine including a plurality of numbered pages and numbered rows of text, comprising:

a processor for deriving said text data from said television signal;

an input circuit for processing said text data;

a picture store connected to receive and store a selected page of said text data from said input circuit;

a background store connected to said processor for storing at least two pages additional to said selected page of said video text data;

a switch connected to deliver said text data from said processor, and said background store to said input circuit;

a control circuit connected to control said switch, whereby said input circuit receives either said processor text data or said background store data, and further connected to control writing of said background store; and

keyboard means connected to said control circuit from which to send a selected page number of said text data to said control circuit, whereby said control circuit identifies, in response to a single page selection, a magazine containing said pages to be written into said background memory, and said control circuit further identifies whether said processor text data or background store data is to be delivered to said picture store.

4,679,084

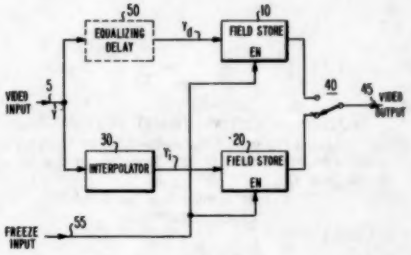
METHOD AND APPARATUS FOR FREEZING A TELEVISION PICTURE

Robert J. Topper, Hatboro, Pa., and Robert A. Dischert, Burlington, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 20, 1986, Ser. No. 876,432

Int. Cl.[4] H04N *5/14*

U.S. Cl. 358—160 **6 Claims**



1. A method of freezing a television picture comprising the steps of:

storing one of successive fields of at least one component of an input video signal;

generating successive fields of motion compensated frame averaged interstitial lines from said input video signal;

storing one of said successive fields of interstitial lines which correspond to said stored field of said input video signal;

repetitively sequencing lines from said stored fields of said input video signal and interstitial lines to form a video signal representing a frozen television picture.

4,679,085

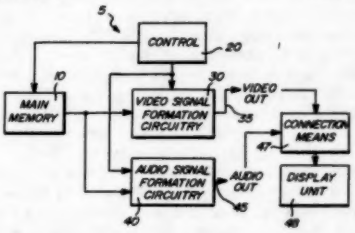
DIGITAL INTEGRATED ELECTRONIC STORAGE SYSTEM FOR VIDEO AND AUDIO PLAYBACK

Robert R. Johnson, Franklin, and Walter E. Chapelle, Southfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Dec. 4, 1984, Ser. No. 678,165

Int. Cl.[4] H04N *5/14, 7/04*

U.S. Cl. 358—160 **117 Claims**



1. A hand holdable, portable, integral memory system comprising:

a supporting substrate;

electrically addressable memory means supported on said substrate for storing information in binary bit form;

addressing means supported on said substrate for addressing said memory means at selected bit locations thereof;

timing means supported on said substrate for controlling said addressing means in a preselected sequence;

coupling means supported on said substrate for interconnecting said memory means, said addressing means and said timing means;

connection means supported on said substrate for providing an external connection to said system;

digital to analog conversion means supported on said substrate for converting said binary bit information into analog form for external read-out; and

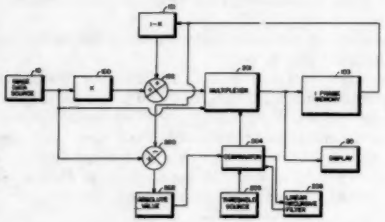
parallel-in serial-out shift register means supported on said substrate and coupled between said memory means and said conversion means for providing said conversion means with discrete pluralities of binary bit information from said memory means.

4,679,086

MOTION SENSITIVE FRAME INTEGRATION

Roger A. May, Longwood, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,894
Int. Cl.[4] H04N *5/213*
U.S. Cl. 358—167 6 Claims



1. An image noise suppression system which receives and conducts image data from a signal source to a display, said image noise suppression system comprising:

a discriminating means which receives said image data from said signal source and produces a discriminating signal indicating when said image data depicts moving objects for pixels and said discriminating signal indicating when said image data depicts stationary objects for pixels;

a memory means which receives, stores and outputs noise suppressed image data;

a means for frame integration which receives said image data from said signal source, and noise suppressed image data from said memory means, said integration means outputting a frame integrated signal comprised of one half of said image data plus one half of said noise suppressed image data from said memory means; and

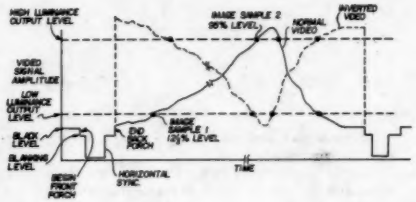
a multiplexer which outputs noise suppressed image data to said memory means and said display by receiving said discriminating signal from said discriminating means and conducting said frame integrated signal from said integration means to said display and said memory means when said discriminating signal indicates said image data depicts stationary objects for pixels, said multiplexer conducting said image data directly to said display and said memory means when said discriminating signal indicates that said image data is depicting moving objects for pixels.

4,679,087

METHOD AND APPARATUS FOR PHOTOGRAPHING VIDEO IMAGES OF EITHER POLARITY WITHOUT CRT BRIGHTNESS OR CONTRAST READJUSTMENT

Michael A. Torrano, Jr., Albany; George E. Lyon, San Francisco, and David H. Haddick, Berkeley, all of Calif., assignors to LogE/Dunn Instruments, Inc., San Francisco, Calif.

Filed Mar. 12, 1984, Ser. No. 588,473
Int. Cl.[4] H04N *5/14, 5/18, 5/84*
U.S. Cl. 358—168 10 Claims



1. In a video display for generating normal and inverted images for photographing, a circuit for maintaining a video signal within a range required to produce a desired image brightness and contrast comprising:

a detector circuit for sampling said video signal at first and second amplitude levels, said detector circuit producing HISS and LISS levels corresponding to said amplitude levels;

a multiplier circuit having first and second voltage inputs for multiplication of two received voltages;

a differential amplifier connected to receive an output level from said multiplier, and a reference signal, said reference signal controlling the output DC level of said differential amplifier;

a drive amplifier connected to receive an output signal from said differential amplifier;

a sample circuit connected to detect a signal from said drive amplifier during a blanking interval, said sample circuit providing a clamped voltage reference signal to said differential amplifier based on a sampled level of the signal from said drive amplifier, whereby during the remaining interval of said video signal, said differential amplifier output voltage is clamped to a known DC level by said clamped reference signal;

a contrast control connected to apply a voltage level to said multiplier second input; and

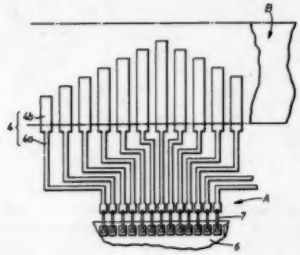
a switch for applying, during a blanking interval of said video signal one of said HISS or LISS levels, whereby said clamped voltage reference signal is produced, and during monitor CRT calibration selectively applying in sequence following said blanking interval, one of said HISS or LISS levels to said multiplier first input, depending on the polarity of the image to be produced, whereby the brightness adjustment for said image is selected under excitation of one of said HISS or LISS levels and the contrast adjustment is selected under excitation of the other of said HISS and LISS levels to establish an image brightness within said range.

4,679,088

IMAGE SENSOR WITH MEANS TO ADJUST CAPACITANCE OF SIGNAL LEADS

Hitoshi Chiyoma, Okegawa; Zensaku Watanabe, Yokohama, and Masahiro Nakagawa, Chofu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 25, 1985, Ser. No. 802,160
Claims priority, application Japan, Nov. 28, 1984, 59-250879; Jun. 25, 1985, 60-136991
Int. Cl.[4] H04N 1/024
U.S. Cl. 358—213.18 16 Claims



1. In an image sensor comprising:

a substrate;

a photoelectric conversion section formed from an array of individual photoelectric conversion elements formed on said substrate;

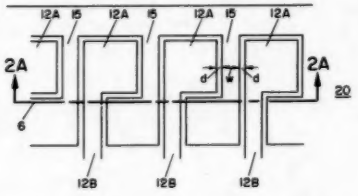
a drive circuit section reading the output signals from said photoelectric conversion elements; said photoelectric conversion section and said drive circuit section being connected by a plurality of conductive strips of which the wiring length of at least one of the strips formed on said substrate is different from the length of another of the strips, the improvement comprising capacitance adjustment conductive strips which correct the wiring length of at least one of said connecting conductive strips, are positioned underneath or close to said photoelectric conversion section, and equalize substantially the stray capacitance of each of said connecting conductive strips.

4,679,089

SOLID STATE IMAGE SENSOR HAVING AN ANTI-BLOOMING ISOLATION ELECTRODE

Toshiaki Kato, Miura, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 11, 1986, Ser. No. 828,288
Claims priority, application Japan, Feb. 15, 1985, 60-27771
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.19 3 Claims



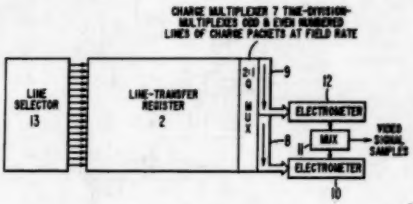
1. An image sensor comprising a large area electrode, a layer of a photosensitive material, overlying the large area electrode and an array of spaced discrete electrodes overlying the layer of photosensitive material, characterized in that an isolation electrode also overlies the layer of photosensitive material including portions in the spaces between the discrete electrodes but separated from the discrete electrodes.

4,679,090

CCD CIRCUITRY FOR LINE-SEQUENTIAL READ OUT OF A PHOTOSENSOR ARRAY

Harry G. Erhardt, East Windsor, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 23, 1986, Ser. No. 824,556
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.26 18 Claims



1. A method for preventing line selection artifacts from occurring in the line trace portions of the video signal samples supplied from a CCD imager of the type using side-loaded CCD shift register circuitry for providing a plurality of charge transfer paths, from the output ports of a parallel array of the charge transfer channels in a line-transfer register, to the input port of a charge sensing stage generating said video signal samples as responses at its output port, said method comprising the steps of:

introducing respective charge packet contents into the charge transfer channels of said line-transfer register during times that those charge transfer channels are not forward clocked;

selectively forward clocking said charge transfer channels over respective intervals of time sufficient to serially transfer their charge packet contents to their output ports; and

keeping the delay of said video signal samples attributable to side loading said CCD shift register circuitry, short enough that said delay does not exceed the length of a line retrace interval.

4,679,091

MULTIPLE SCANNING TYPE TELEVISION RECEIVER

Masafumi Kikuchi; Toshio Onodera; Sumio Toyama, all of Kanagawa, and Hiroshi Sakamoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,249
Claims priority, application Japan, Oct. 15, 1984, 59-215856
Int. Cl.[4] H04N 5/68
U.S. Cl. 358—242 10 Claims

1. A television receiver comprising:

video signal receiving means for receiving a video signal, a vertical synchronizing signal and a horizontal synchronizing signal;

a signal processing circuit for supplying said video signal to a cathode ray tube;

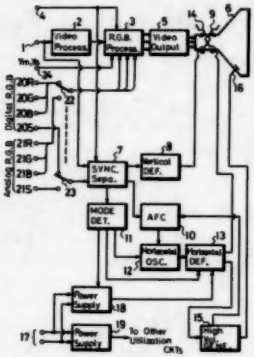
a vertical deflection circuit for supplying a vertical deflection signal to said cathode ray tube in response to said vertical synchronizing signal;

a horizontal deflection circuit for supplying a horizontal deflection signal to said cathode ray tube in response to said horizontal synchronizing signal;

frequency detecting means connected to said video signal receiving means for detecting the frequency of said horizontal synchronizing signal and deriving a control signal in response thereto; and

control means connected between said frequency detecting means and said horizontal deflection circuit for controlling the latter in response to said control signal from the former;

characterized in that said horizontal deflection circuit includes means for changing a duty cycle of a horizontal



drive pulse such that the duty cycle increases when the horizontal frequency becomes higher.

4,679,092

REDUCED DISTORTION DISPLAY CIRCUIT

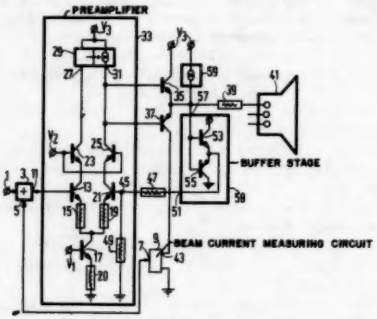
Pieter G. Blanken, and Pieter van der Zee, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1986, Ser. No. 833,631

Claims priority, application Netherlands, Mar. 6, 1985, 8500621; Sep. 27, 1985, 8502637

Int. Cl.[4] H04N *5/68*

U.S. Cl. 358—242 **5 Claims**



1. A picture display device comprising a picture display tube a cathode of which is coupled to an emitter-follower drivable by a video preamplifier, a negative feedback signal input of the video preamplifier being coupled to an output of a negative feedback circuit and the collector of the emitter-follower being coupled to an input of a beam current measuring circuit, characterized in that the negative feedback signal input is coupled to an output of a substantially distortion-free buffer stage which is drivable by the emitter-follower.

4,679,093

IMAGE COMMUNICATION APPARATUS

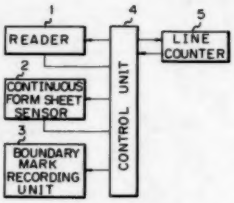
Tatsuya Yaguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,252

Claims priority, application Japan, Dec. 5, 1983, 58-228350; Dec. 5, 1983, 58-228351

Int. Cl.[4] H04N *1/32*

U.S. Cl. 358—257 **16 Claims**



1. An image communication apparatus comprising:

read means for reading an original image, line by line;

detection means for detecting a length of an original sheet;

discrimination means for discriminating that the length of the original sheet is longer than a length of a cut record sheet in a receiving unit, in response to an output of said detection means;

transmission means for transmitting the original image in a division means, in response to an output of said discrimination means; and

inform means for informing that the original image is transmitted in the division manner in response to the output of said discrimination means.

4,679,094

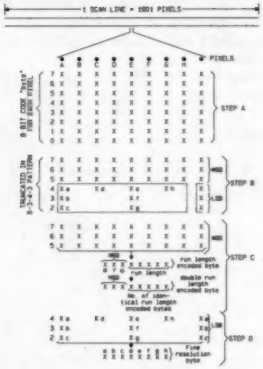
METHOD FOR COMPRESSION AND TRANSMISSION OF VIDEO INFORMATION

David G. Rutherford, North Caldwell; Alain Regnault, Westfield, and John Kirlick, River Vale, all of N.J., assignors to The Associated Press, East Brunswick, N.J.

Filed Oct. 14, 1986, Ser. No. 918,848

Int. Cl.[4] H04H *1/419*

U.S. Cl. 358—261 **12 Claims**



8. A method for encoding digital video information derived from the scanning of an image to provide a digital code wherein a series of data bits define the values of corresponding pixels of said image, comprising the steps of:

(a) providing a first predetermined number of most significant data bits and a second predetermined number of less significant data bits defining the value of each pixel;

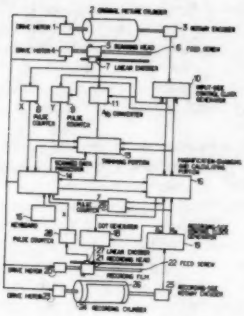
(b) run length encoding said most significant data bits of each pixel; and

(c) combining in a bit train with said run length encoded most significant data bits a series of fine resolution bytes, each of said fine resolution bytes containing one or more less significant data bits of selected ones of a group of adjacent pixels.

4,679,095
METHOD AND APPARATUS OF SCANNING AND RECORDING IMAGE

Hideaki Kitamura, Ibaragi, and Mitsuhiko Yamada, Kyoto, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jun. 21, 1985, Ser. No. 747,346
Claims priority, application Japan, Jul. 6, 1984, 59-140996
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—280 **7 Claims**



1. A method of scanning and recording images, comprising the steps of:

attaching a plurality of original pictures to an original picture cylinder;

setting trim-regions in respective pictures of said plurality of original pictures;

preliminarily photoelectrically scanning said trim-regions of said respective original pictures so as to obtain signals therefor;

sampling said image signals at a predetermined pitch;

subjecting said sampled image signals to statistical classification and treatment for obtaining density data of a high light point and a shadow point of each original picture;

determining respective scanning condition data necessary for an optimum gradation correction and an optimum color correction for each said original picture based upon said density data;

storing said scanning condition data on each original picture of said plurality of original pictures;

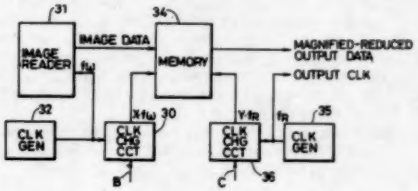
successively setting up an image scanning and recording apparatus with respective scanning condition data of said scanning condition data previously stored; and

sequentially scanning and recording for duplicates of said plurality of original pictures based on respective scanning condition data on respective original pictures set up in the setting up step.

4,679,096
IMAGE PROCESSING APPARATUS

Nao Nagashima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,753
Claims priority, application Japan, Mar. 30, 1983, 58-52743
Int. Cl.[4] H04H *1/04*
U.S. Cl. 358—287 **27 Claims**



1. An image processing apparatus comprising:

image data output means;

memory means for storing the image data output from said image data output means;

read clock signal generating means for generating a read clock signal to read out the image data stored in said memory means, said read clock signal generating means reducing a frequency of the read clock signal in accordance with a magnification factor to achieve image enlargement;

output clock signal generating means for generating an output clock signal to sample the image data read from said memory means; and

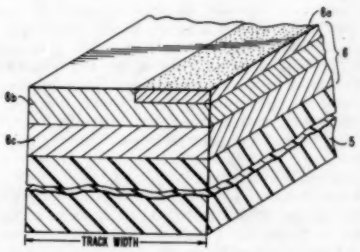
write clock signal generating means for generating a write clock signal to write the image data output from said image data output means into said memory means, said write clock signal generating means varying a frequency of the write clock signal in accordance with the magnification factor;

wherein the frequency of said read clock signal is equal to, in equal size reproduction, or lower than the frequency of said output clock signal.

4,679,097
METHOD OF RECORDING AND REPRODUCING VIDEO AND AUDIO SIGNALS ON A MAGNETIC TAPE

Masao Tomita, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 27, 1984, Ser. No. 675,395
Claims priority, application Japan, Nov. 30, 1983, 58-225933; Dec. 6, 1983, 58-230130; Jul. 31, 1984, 59-161713
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—328 **22 Claims**



1. A method of recording and reproducing video and audio signal on video tracks on a magetic tape having a magnetic layer by using first and second magnetic heads which have different azimuths from each other and which are mounted on

a rotary cylinder so that said first magnetic head first scans a predetermined video track and thereafter said second magnetic head scans the same predetermined video tracks, said method comprising the steps of:

recording said video signal on said predetermined video track by said first magnetic head so that said first signal is recorded to extend to a substantial depth in said magnetic layer;

recording said audio signal on said predetermined video track by said second magnetic head, wherein said second magnetic head has a gap length which is shorter than that of said first magnetic head so that said audio signal is recorded in a shallower part of said magnetic layer throughout said predetermined video track, said video signal remaining in said magnetic layer at a part below said shallower part; and

reproducing said video and audio signals overlapping on said predetermined video track by said first and second magnetic heads, respectively.

4,679,098

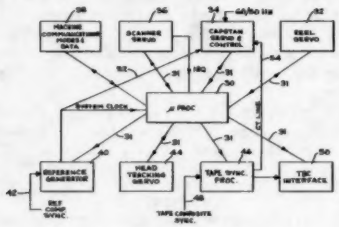
VIDEO TAPE TRANSPORT SERVO FOR VARIABLE TAPE SPEED CONTROL

Marshall Williams, Fremont, and David R. Rodal, Palo Alto, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 768,164, Aug. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 419,631, Sep. 17, 1982, abandoned. This application Mar. 6, 1986, Ser. No. 837,520

Int. Cl.[4] H04N *5/782;* **G11B** *15/46*

U.S. Cl. 360—10.1 **12 Claims**



1. A capstan servo for moving video tape with variable speed during reproducing, said capstan servo being capable of detecting and responding to a recording control track signal, a stable reference vertical signal, a sync/async select line, and a high rate clock, said servo comprising:

input means for inputting a specified time period to said capstan servo;

programmable counting means clocked by the high rate clock for providing a controllable vertical sync output signal for use in providing a closed loop control track locked tape drive, said counting means having a synchronous mode of operation using the stable reference vertical signal as a synchronizing input, having means to disable said synchronizing input, and having a free-wheeling mode of operation when said synchronizing input is disabled, the enabling and disabling being responsive to tne state of the sync/async line;

processing means for programming said counting means with a presettable count, said presettable count determining the frequency of said controllable vertical sync signal;

tape speed override means for enabling and disabling said synchronizing input in response to the signal carried on the sync/async select line; and

conversion means for converting said specified time period to said presettable count and providing said presettable count to said processing means.

4,679,099

INFORMATION SIGNAL REPRODUCING APPARATUS

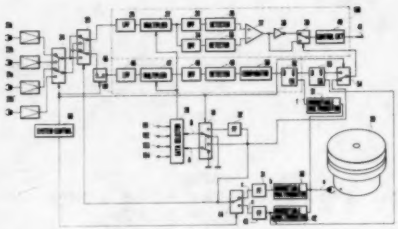
Hiroo Edakubo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,799

Claims priority, application Japan, Jul. 28, 1983, 58-138549

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—10.2 **18 Claims**



1. An information signal reproducing apparatus, for reproducing information signals from a recording medium having formed thereon a plurality of tracks having successively recorded thereon four pilot signals with frequencies different from one another along with information signals, comprising:

(a) reproducing means for tracing said plurality of recorded tracks for reproducing the information signals;

(b) moving means for moving the recording medium in a direction intersecting said plurality of recorded tracks;

(c) change-over means for switching said apparatus between a first reproducing mode and a second reproduction mode wherein:

in said first reproduction mode said moving means moves said recording medium at a first speed with which said number of tracks are formed; and

in said second mode said moving means moves the recording medium at a speed different from said first speed;

(d) generation means for selectively generating four reference signals having different frequencies;

(e) selection control means for controlling said generation means so as always to generate a single reference signal in said second mode and to periodically and sequentially generate four reference signals in said first mode;

(f) signal processing means for forming a tracking control signal for said reproducing means by using said signal of the reference signals obtained from said generation means and the pilot signals reproduced by said reproducing means; and

(g) tracking control means for controlling the tracking of said reproducing means based on said tracking control signal.

10. An information signal reproducing apparatus, for reproducing information signals from a recording medium having formed thereon a number of tracks on which four pilot signals having frequencies different from one another are recorded and on which information signals are recorded, comprising:

(a) reproducing means for tracing said plurality of recorded tracks for reproducing the information signals;

(b) signal processing means for forming a tracking control signal for said reproducing means by using said pilot signals reproduced at a first timing by said reproducing means;

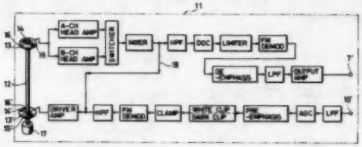
(c) process control means for controlling processing characteristics of said signal processing means by using pilot signals reproduced by a second timing different from the first timing; and

(d) tracking control means for controlling the tracking of said reproducing means based on said tracking control signal.

4,679,100
ROTARY HEAD TYPE MAGNETIC RECORDING AND REPRODUCING DEVICE

Hiroshi Yokota, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,905
Claims priority, application Japan, Aug. 31, 1984, 59-180707
Int. Cl.[4] G11B 5/86, 27/02
U.S. Cl. 360—15 2 Claims

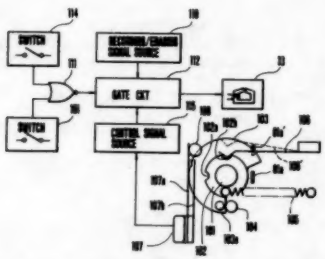


1. A magnetic recording and reproducing device in which a reproducing signal outputted by first rotary head means is recorded by second rotary head means, comprising: a drum motor; a single rotary shaft rotated by said motor; a first rotary disk on which said first rotary head means is mounted; a second rotary disk on which said second rotary head means is mounted, said first and second rotary disks being mounted on said single rotary shaft in such a manner that said first and second rotary disks are rotated by said drum motor; first and second magnetic heads borne by said first and second rotary disks, respectively; first and second head amplifiers; means for coupling outputs of said first and second magnetic heads to said first and second head amplifiers, respectively; switching means receiving as inputs outputs of said first and second head amplifiers; mixer means receiving as an input an output of said switching means; and means for driving said second rotary head means in response to an output of said mixer means.

4,679,101
INFORMATION RECORDING OR ERASING APPARATUS

Nobuo Tezuka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,038
Claims priority, application Japan, Aug. 25, 1982, 57-147290
Int. Cl.[4] G11B 5/02, 5/09
U.S. Cl. 360—60 26 Claims



1. An apparatus for use with a recording medium housed in a cassette, said cassette having settable means for indicating inhibition of recording or erasing operation, said apparatus comprising:

(A) means for recording signals or erasing recorded signals on or from said recording medium;

(B) first means responsive to said settable means of said cassette for inhibiting said means for recording or erasing from recording or erasing the signals on or from said recording medium when said settable means is set to indicate inhibition of the recording or erasing operation;

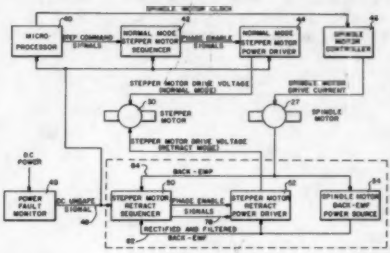
(C) second means for enabling said means for recording or erasing to record or erase signals on or from said recording medium in a condition that said first means is inhibiting the recording or erasing of the signals; and

(D) third means for resetting said second means from its operated state at which the second means enables said means for recording or erasing to record or erase the signals regardless of said first means to its nonoperated state.

4,679,102
METHOD AND MEANS FOR PARKING READ/WRITE HEADS IN A DISC DRIVE USING THE BACK-EMF OF THE SPINDLE MOTOR TO OPERATE A STEPPER MOTOR

William E. Wevers; James N. Krause, both of Santa Clara County, and Ramgopal Battu, Los Angeles County, all of Calif., assignors to Seagate Technology, Scotts Valley, Calif.

Filed Nov. 20, 1985, Ser. No. 800,060
Int. Cl.[4] G11B 5/54, 21/02
U.S. Cl. 360—75 16 Claims



1. In a disc drive comprising a plurality of discs mounted for rotation within a disc drive housing, a spindle motor for driving said discs in rotation, an actuator for reciprocatably driving a transducer array relative to the discs, said actuator including a carriage for said transducer array and a stepper motor drivingly connected to the carriage for positioning the carriage and transducer array relative to the discs and a circuitry for detecting removal of power, means for parking the transducer array at a defined park position relative to the discs after power is removed from the drive comprising circuitry for disabling normal stepper motor control and a stepper motor retract sequencer circuit coupled between the spindle motor and selected windings of the actuator stepper motor and responsive to an output of said spindle motor to energize said windings of the stepper motor to move the transducer array to a defined position.

4,679,103
DIGITAL SERVO CONTROL SYSTEM FOR A DATA RECORDING DISK FILE

Michael L. Workman, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1986, Ser. No. 857,263
Int. Cl.[4] G11B 5/55, 5/56
U.S. Cl. 360—77 16 Claims

1. A method for controlling the data track seeking and following of a head in a data recording disk file of the type having a disk with servo information thereon defining data track centerlines, a head for reading samples of the servo information during rotation of the disk, an actuator connected to the head and responsive to an input signal for positioning the head to the centerline of a target track during track seeking and maintaining the head over the centerline of the target track during track following, the method comprising the steps of:

generating from the servo information a sampled head posi-

tion error signal (PES) representative of the position of the head relative to the centerline of the nearest track;

estimating, for each PES sample, the absolute head position, relative to a fixed reference, and the head velocity;

estimating, for each PES sample, the equivalent actuator input signal required to compensate for bias forces acting on the actuator;

measuring, for each PES sample, the input signal to the actuator;

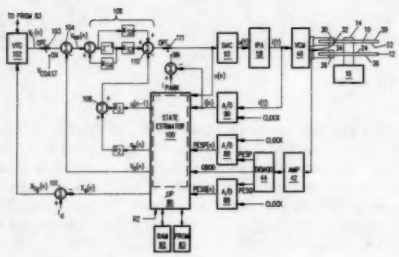
computing, for each PES sample, a commanded head velocity as a function of the distance from the estimated absolute head position to the target track;

computing, for each PES sample, the head velocity error as a function of the difference between the commanded head velocity and the estimated head velocity;

estimating, for each PES sample, the head acceleration as a function of the measured actuator input signal and estimated bias force equivalent actuator input signal;

generating, for each PES sample, a control signal as a function of the head velocity error, the estimated head acceleration, and the control signal generated for the prior PES sample;

integrating the control signal;



providing the integrated control signal as the input signal to the actuator;

storing, for each PES sample, the estimated absolute head position, the estimated head velocity, the estimated bias force equivalent actuator input signal, the measured actuator input signal and the control signal;

predicting, for each PES sample, the absolute head position and the head velocity as functions of prior control signals, the prior estimated absolute head position, the prior estimated head velocity, the prior estimated bias force equivalent actuator input signal and constants representative of physical parameters of the actuator, the predicted absolute head position and velocity for each PES sample being used during the step of estimating the absolute head position and head velocity for the subsequent PES sample; and

predicting, for each PES sample, the bias force equivalent actuator input signal as a function of the prior estimated bias force actuator input signal, the predicted bias force equivalent actuator input signal for each PES sample being used during the step of estimating the bias force equivalent actuator input signal for the subsequent PES sample.

4,679,104

METHOD AND ARRANGEMENT FOR POSITIONING A MAGNETIC HEAD TO VARIOUS TRACKS OF A MAGNETIC TAPE

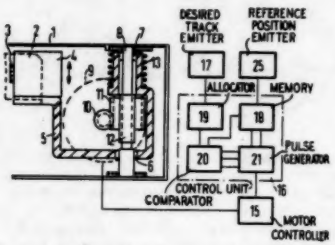
Ole C. Dahlerud, Oslo, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Jan. 16, 1986, Ser. No. 819,496

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504384

Int. Cl.[4] G11B *5/55*

U.S. Cl. 360—78 **14 Claims**



1. A method for positioning a magnetic head to various tracks of a magnetic tape in a magnetic tape recorder, comprising the steps of:

positioning said magnetic head to said various tracks perpendicular to a moving direction of said magnetic tape by use of a positioning device provided with an electric motor;

defining a reference position on the magnetic tape;

identifying substantially exact desired position of a write/-read head of said magnetic tape during a measuring procedure by a positioning to at least one track relative to said reference position;

determining desired positional values corresponding to said substantially exact desired positions; and

during normal operation of said magnetic tape recorder, generating actual positional values corresponding to actual positions of the write/read head, and control signals for a motor controller connected to the motor being derived by a comparison of the actual positional values to said desired positional values so as to drive said electric motor of said positioning device unitl the actual and desired positional values correspond.

4,679,105

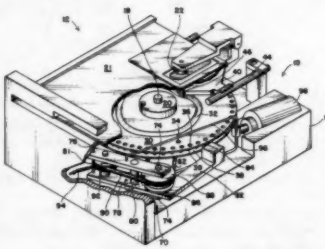
HEAD POSITIONING ASSEMBLY FOR A DISK DRIVE

Christopher J. Maryatt, 175 Calvert Dr. No. N-203, Cupertino, Calif. 95014

Filed Jan. 25, 1985, Ser. No. 695,084

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—97 **36 Claims**



1. A positioning assembly for positioning a point element on a rotating member, comprising:

a carriage member mounted such that it is permitted to move only along a radial segment with respect to the rotating member, the carriage supporting the point element to be positioned and further including a cam follower;

a locating disk having a cam groove formed on the surface thereof, with the groove forming a closed path about the origin of the locating disk and having varying radial separation thereform, such that said cam follower rides within said cam groove in a manner such that the carriage is caused to move as the locating disk is rotated; and

means for selectively causing said locating disk to rotate in a predetermined manner.

4,679,106

SPRING LOADED EJECTOR FOR DISC CARTRIDGE

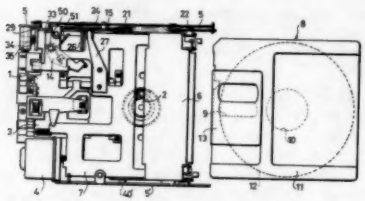
Masao Okita, Furukawa; Kunihiko Gunji, Tajiri, and Yukio Saito, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 626,316, Jun. 29, 1984, abandoned. This application Nov. 10, 1986, Ser. No. 930,035

Claims priority, application Japan, Jun. 29, 1983, 58-99335[U]

Int. Cl.[4] G11B *5/012, 5/016, 23/03*

U.S. Cl. 360—99 **3 Claims**



1. In a recording and reproducing device using a disk cartridge of the type having a case with a front end to be inserted in the recording and reproducing device, a magnetic disk enclosed in the case, a magnetic head insertion hole in an upper wall at the front end of the case for exposing the magnetic disk to a magnetic head in the recording and reproducing device, and a shutter plate at the front end of the case covering the hole at a covering position which is movable in one sidewards direction to an uncovered position to expose the insertion hole when the disk cartridge is inserted in the recording and reproducing device, and plate biasing means connected to the shutter plate for returning it to the covered position when the cartridge is removed from the recording and reproducing device, and

the recording and reproducing device being of the type having a frame with a front insertion slot for the disk cartridge, a cartridge holder mounted in the frame for receiving a disk cartridge inserted therein at an eject position, loading means for moving the cartridge holder to a loaded position when the cartridge has been inserted to a fully inserted position in the holder, holding means for holding the cartridge holder in the loaded position, a magnetic head positionable through the insertion hole of the cartridge at the loaded position for recording on and reproducing from the disk, and releasing means for releasing the cartridge holder from the loaded position to the eject position when the cartridge is to be ejected from the frame,

the improvement comprising a single eject lever supported rotatably at a rear position inside the cartridge holder having an abutting portion which is positioned to abut against a portion of the shutter plate as the cartridge is inserted in the holder, said abutting portion remaining engaged with said shutter plate as said cartridge continues to be inserted in the holder to the fully inserted position and said lever rotating therewith in a direction corresponding to the resulting movement of the shutter plate in said sidewards direction to the uncovered position so as to expose said insertion hole in the cartridge, wherein said magnetic head can be positioned in said insertion hole when said cartridge holder is moved by said loading means to the loaded position, and a spring member mounted with the eject lever for biasing it with a stored spring force as it is rotated by insertion of the cartridge to the fully inserted position so as to provide a returning force for rotating the eject lever in the direction for ejecting the cartridge from the holder when the holder is released by said releasing means from the loaded position to the eject position,

whereby said single eject lever and spring member obtains both the functions of opening the shutter plate of the disk cartridge and ejecting the cartridge from the holder, while being movable with the cartridge and holder between the eject and loaded positions so as to avoid frictional forces with other parts of the recording and reproducing device.

4,679,107

MAGNETIC TRANSDUCER HEAD UTILIZING MAGNETORESISTANCE EFFECT

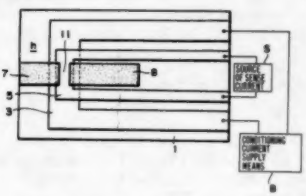
Shigeyoshi Imakoshi; Yutaka Soda; Hideo Suyama, and Yasuhiro Iida, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,398

Claims priority, application Japan, Aug. 25, 1983, 58-155484

Int. Cl.[4] G11B *5/127, 5/33*

U.S. Cl. 360—113 **2 Claims**



1. A magnetic transducer head utilizing the magnetoresistance effect, comprising:

a magnetoresistance effect element for sensing a magnetic field during each of a plurality of readout operations;

source means for supplying a sense current to said magnetoresistance effect element for sensing resistance change of said magnetoresistance effect element during each readout operation;

a conductor for applying a bias magnetic field to said magnetoresistance effect element by being supplied with a bias current; and

an alternating current source for supplying a decaying alternating current superimposed on said bias current to said conductor prior to each readout operation wherein said magnetic field is to be sensed by said magnetoresistance effect element.

4,679,108

PORTABLE PLAYBACK SYSTEM WITH ACTIVE TAPE DRIVE TENSIONING FEATURE

Keith E. Thomas, San Fernando, Calif., assignor to Capitol Records, Inc., Hollywood, Calif.

Filed Feb. 2, 1983, Ser. No. 463,290

Int. Cl.[4] G11B *15/60*

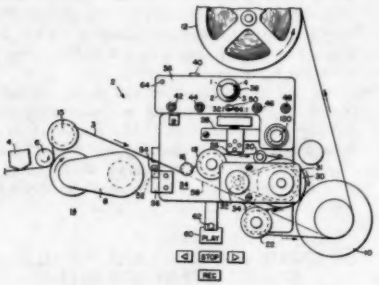
U.S. Cl. 360—130.31 **16 Claims**

1. An apparatus for use in monitoring signals recorded on a recording tape by a tape recorder, the tape recorder operating during a recording mode to transport the recording tape past a recording device on the tape recorder while applying a preselected tension to the recording tape, said apparatus comprising:

mounting means for positioning said apparatus relative to

the tape recorder during the operation of the tape recorder in its recording mode;

a head means disposed on said mounting structure for detecting signals recorded on the recording tape and for generating playback signals in response to the signals so detected, and;



a drive means also supported by said mounting means in fixed relation to said head means for guiding the recording tape along a predetermined path through said apparatus while the tape recorder is operating in its recording mode and for pulling the recording tape past said head means with a tension which is independent of the preselected tension applied to the recording tape by the tape recorder.

4,679,109

TAPE CASSETTE DRIVEN RIB DEVICE

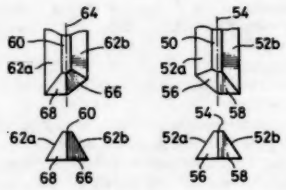
Masatoshi Okamura, Saku, and Haruo Shiba, Komoro, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,586

Claims priority, application Japan, Aug. 23, 1984, 59-127812[U]

Int. Cl.⁴ G11B *15/32, 23/04*

U.S. Cl. 360—132 **3 Claims**



1. A tape cassette including a pair of reels for a magnetic tape, each reel having a center opening, a plurality of first ribs extending radially into said opening from a peripheral wall of said opening, a pair of parallel drive spindles of a recorder deck, said drive spindle being adapted for insertion into one said opening, each drive spindle having a second rib, said second rib being adapted for engagement with said first rib, said first rib comprises an end face having a planar surface on a trailing side of said first rib, said trailing side being defined with respect to a tape-slacking removing rotational direction, said planar surface being inclined in such a manner that insertion of said spindles into said opening whereby said second rib engages said first rib, creates a force which drives said reel in said tape-slack removing rotational direction.

4,679,110

BRAKE AND TAPE TENSIONING MEANS FOR TAPE CASSETTES HAVING FLANGED REELS, AND A TAPE CASSETTE, IN PARTICULAR A MAGNETIC TAPE CASSETTE, INCLUDING THESE MEANS

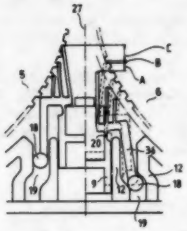
Klaus Schoettle, Heidelberg; Kurt Schmidts, Kehl; Eugen Kamm, Appenweier, and Heinz Berger, Kehl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 751,809

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 8420207

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—132 **13 Claims**



1. Brake and tape tensioning means for tape cassettes having a housing and flanged reels contained therein, in which at least one flange of each reel carries toothing at its periphery and a spring element for each reel having a braking position and a release position, said spring element engaging said toothing in said braking position but not in said release position, for use with a recording apparatus having an actuating element, said actuating element entering the cassette housing and transferring the spring element from its braking position to its release position, and positioning elements being provided on the cassette which guide each spring element from the braking position to the release position and vice versa,

wherein the spring element comprises two locking elements of different lengths, in a tangential direction to the periphery of the toothed flange, said locking elements having two ends, one being an attached end and the other being a free end, locking points being provided at said free ends and the distance between the first and second locking points being determined by the relationship

$$x_{1-2} = t(n + \tfrac{1}{2}),$$

where

t is the tooth spacing and

n is the integer 0, 1, 2, 3 etc.,

whereby for the same tooth spacing an increase in the effective minimum tape take-up is achieved.

4,679,111

RESISTANCE TO GROUND CHECKER

Karl C. Koch, Swissvale, and Charles W. Einolf, Jr., Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1985, Ser. No. 797,335

Int. Cl.⁴ H02H *7/08*

U.S. Cl. 361—31 **14 Claims**

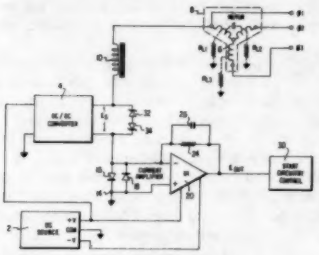
14. In combination: a motor having at least one normally ungrounded coil; and a circuit arrangement for checking the resistance to ground of said normally ungrounded coil, said circuit arrangement comprising:

a source of a low-level d.c. voltage, said source being independent of said motor and having first and second output terminals between which the d.c. voltage is established;

means for establishing a conductive connection between said first output terminal and said coil;

grounding means connected to a point at ground potential relative to said coil;

current responsive means connected between said grounding means and said second output terminal of said source



for producing an output signal proportional to the amplitude of current flow between said second terminal and said grounding means; and

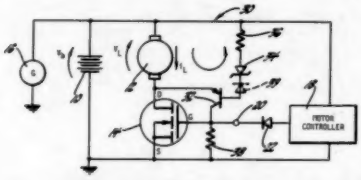
motor control means connected for receiving the output signal and preventing operation of said motor when the output signal reaches a selected value.

4,679,112

TRANSISTOR PROTECTION CIRCUIT FOR AUTOMOTIVE MOTOR CONTROL APPLICATIONS

Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1986, Ser. No. 891,011
Int. Cl.[4] H02H *7/09, 3/18*
U.S. Cl. 361—33 **4 Claims**



1. In an automotive control circuit including a storage battery, and the serial combination of an electric motor and a power transistor connected across the battery, the power transistor being biasable to a conductive state in which current is supplied from the battery to the motor through the primary conduction circuit of the power transistor when a conduction producing control voltage is applied across its conduction control terminals, a protection circuit which protects the power transistor from damage due to the generation of transient inductive voltage across the motor when the conduction producing control voltage is removed from the conduction control terminals, the protection circuit comprising:

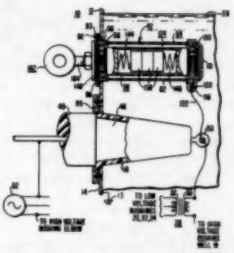
a protection transistor having an emitter-collector circuit connected in series with a resistor across the primary conduction circuit of the power transistor, the resistor being connected across the conduction control terminals of the power transistor, and a Zener diode connected in series with the emitter-base circuit of the protection transistor across the motor, the Zener diode being poled to oppose current flow through such emitter-base circuit, such that when a transient inductive voltage is generated across the motor upon removal of the control voltage, the reverse breakdown voltage of the Zener diode is exceeded and the protection transistor is biased conductive to permit current flow in a circuit comprising the battery, the motor, the emitter-collector circuit of the protection transistor, and the resistor, thereby to generate a voltage across the resistor which biases the power transistor to a partially conductive state for reducing the rate of decrease in current through the motor and the magnitude of the resulting transient inductive voltage.

4,679,113

ELECTRICAL DISTRIBUTION APPARATUS HAVING DRAW-OUT SURGE ARRESTER

William J. Book; Julian C. Scott, and James A. Grace, all of Jefferson City, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 18, 1985, Ser. No. 799,040
Int. Cl.[4] H02H *7/04*
U.S. Cl. 361—40 **8 Claims**



1. Electrical distribution apparatus, comprising:

an electrically grounded metallic tank having an opening,

an electrical element in said tank,

and an arrester assembly including a housing which extends into said tank via said tank opening, and a draw-out surge arrester in said housing having first and second insulatively spaced electrical contacts,

said housing including first and second insulatively spaced metallic means,

said first metallic means of said housing mechanically mounting said housing to said tank and electrically connecting the first electrical contact of said draw-out surge arrester to said grounded metallic tank,

said second metallic means of said housing electrically connecting the second electrical contact of said draw-out surge arrester to said electrical element.

4,679,114

METHOD AND EQUIPMENT FOR LIGHTNING PROTECTION THROUGH ELECTRIC POTENTIAL NEUTRALIZATION

Roy B. Carpenter, Jr., 9444 Tierra Blanca, Whittier, Calif. 90603

Filed Apr. 9, 1986, Ser. No. 849,790
Int. Cl.[4] H02H *3/22*
U.S. Cl. 361—117 **3 Claims**

1. A method for the protection of areas and objects arranged on them against lightning strikes through electric potential neutralization

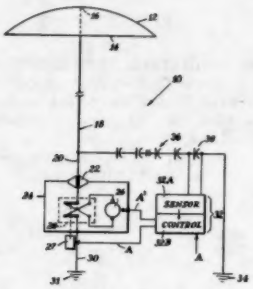
comprising:

sensing the presence, the magnitude and the polarity of at least one electric charge above an area intended to be protected,

setting controls upon the sensing of said at least one electric charge,

activating a d.c. high-potential power source to an output potential of a magnitude and in a polarity so as to neutralize said electric charge in accordance with said control setting,

adjusting the magnitude and the polarity of said output potential in accordance with any changes of the magnitude and the polarity, respectively, of said charge as sensed and as commanded by said control upon being activated by said sensor for the duration of each charge presence,



terminating said d.c. high-potential power source operation and its output upon the cessation of charge magnitude and polarity sensing and of the control activation,

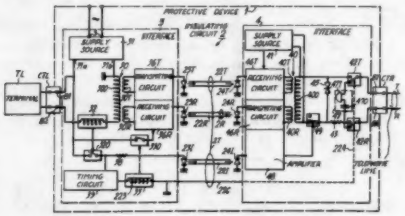
restoring said sensor, said control and said d.c. high-potential power source for a subsequent operation.

4,679,115

ELECTRICAL DISTURBANCE PROTECTIVE DEVICE BETWEEN A TERMINAL AND A TELEPHONE LINE

Jean-Louis Connan, Apartment AD 222, rue d'Anjou, and Jean-Yves Huiban, Ker-Squivel-Izillian, Ploulech, both of, 22300 Lannion, France

Filed Feb. 27, 1985, Ser. No. 706,287
Claims priority, application France, Mar. 5, 1984, 84 03381
Int. Cl.[4] H02H *3/22*
U.S. Cl. 361—119 **15 Claims**



1. An electrical disturbance protective system connected between a terminal (TL) and a telephone line (TR), comprising:

(a) first (3) and second (4) interfaces connected with the terminal and with the telephone line via first (CTL) and second (CTR) telephone circuit closers, respectively, said first interface including first transmitting means (23T) for converting first electrical signals delivered from said terminal into first optical signals, and said second interface means including first receiving means (24T) for reconverting said first optical signals back into said first electrical signals for introduction into the telephone line; said second interface including second transmitting means (24R) for converting electrical signals supplied by said telephone line into second optical signals, and said first interface including second receiving means (23R) for reconverting said second optical signals back into said second electrical signals for transmission to said terminal; said first interface including third transmitting means (23I) for transmitting third optical pulses corresponding with current loop pulses derived from the terminal during a dialling period thereof, said second interface including third receiving means (24I) for reconverting said third optical pulses into current loop pulses for transmission into the telephone line;

(b) first (22T), second (22R) and third (22I) electrical insulating means for guiding said first, second, and third optical signals, respectively, between said first and second interfaces;

(c) said first interface including first supply circuit means (31) for supplying power from an alternatingcurrent source thereof (S) to said first and third transmitting means and said second receiving means, said first supply circuit means also supplying power to said terminal via said first telephone circuit closer (CTC);

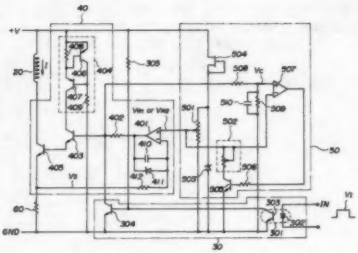
(d) said second interface further including second supply circuit means (41) for supplying from said telephone line remote power to said second transmitting means and said first and third receiving means.

4,679,116

CURRENT CONTROLLING DEVICE FOR ELECTROMAGNETIC WINDING

Hidekazu Oshizawa, and Masami Kondoh, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,240
Claims priority, application Japan, Dec. 18, 1984, 59-265415
Int. Cl.[4] H01H *47/32*
U.S. Cl. 361—154 **7 Claims**



1. A current controlling device for an electromagnetic winding comprising:

an input circuit for receiving a driving signal;

reference voltage supply means, responsive to said driving signal, for supplying a first reference voltage or a second reference voltage lower than the first reference voltage, said first and second reference voltages being controlled at substantially constant respective values, said first reference voltage being supplied until a predetermined time after the receipt of said driving signal, said second reference voltage being supplied from said predetermined time after the receipt of said driving signal until said driving signal is no longer received;

a detecting resistor, connected to said electromagnetic winding, for detecting current flowing through said electromagnetic winding and providing a detected voltage representative thereof;

comparison amplifier circuit means, responsive to said driving signal, for supplying as an output a first analog control output or a second analog control output, said comparison amplifier circuit means receiving said detected voltage and either one of said first or second reference voltages, whichever is supplied by said reference voltage supply means, providing said first analog control output when receiving said first reference voltage, said first analog

control output causing the difference between said first reference voltage and said detected voltage to become zero, and providing said second analog control output when receiving said second reference voltage, said second analog control output causing the difference between said second reference voltage and said detected voltage to become zero; and

driving circuit means, responsive to said first and second analog control outputs, for controlling a starting current flowing through said electromagnetic winding at a substantially constant value in accordance with said first analog control output and for controlling a holding current flowing through said electromagnetic winding at another substantially constant value in accordance with said second analog control output, said holding current being lower in value than said constant value of said starting current.

4,679,117

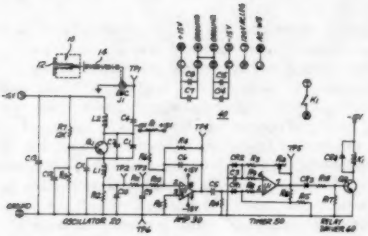
TOUCH SENSOR FOR WIRE STRIPPER

William T. Butcher, Redmond; James J. Furlong, Seattle; Dwayne E. Howe, Kent, all of Wash.; Gerald T. Snell, Hillsboro, Oreg., and Calvin M. Yara, Kaneohe, Hi., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 362,020, Mar. 25, 1982, abandoned. This application Mar. 14, 1986, Ser. No. 839,661

Int. Cl.⁴ H01H *47/12*

U.S. Cl. 361—181 **1 Claim**



1. An adjustable picofarad detector circuit comprising in combination:

a capacitance sensing probe having an electrically conductive plate member;

an oscillator circuit coupled to said capacitance sensing probe;

a timer circuit;

an inverse amplifier circuit coupled between said oscillator circuit and said timer circuit for providing a discrete level output signal thereby triggering said timer circuit;

a relay driver circuit responsive to said timer circuit for an adjustable time period; and

further including an air solenoid, and a mercury wetted relay coupled between said relay driver circuit and said air solenoid, said air solenoid when actuated permitting pneumatic mechanism cycling for wire stripping.

4,679,118

ELECTRONIC CHIP-CARRIER HEAT SINKS

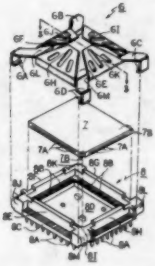
Philip A. Johnson, Exeter, and Alfred F. McCarthy, Belmount, both of N.H., assignors to Aavid Engineering, Inc., Laconia, N.H.

Continuation of Ser. No. 638,415, Aug. 7, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 890,890

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **6 Claims**

1. An electronic chip-carrier mounting and heat sink, comprising a socket of insulating material having an outwardly-projecting array of electrical leads disposed for connection with circuit-board wiring and an inner array of electrical contacts framing an upwardly-opened recess in said socket and disposed to engage edge contacts of a leadless chip carrier which may be nested therein and thereby couple such edge contacts with said leads, and a single-piece composite heat-sink and cover means stamped from sheet metal having good thermal conductivity and adapted for dissipation of heat from such a carrier which may be nested in said recess and for movements between a closed position in which it presses against and closes over such a carrier and an open position in which it releases such a carrier from said socket, said composite heat-sink and cover means including a relatively broad-area central heat-sink portion having a substantially planar and uninterrupted lower heat-transfer surface disposed to press against a surface of the same size and shape as the top of such a carrier nested in said



recess and further having stamped sheet-metal heat-radiating members integral therewith along edges thereof bent to extend upwardly away from said surface and from the top of such a carrier, said heat-transfer surface of said central portion conducting heat from such a carrier laterally to said heat-radiating members along said edges thereof and said heat-radiating members in turn convectively releasing the heat to an ambient atmosphere, and said composite heat-sink and cover means including fastener means disposed laterally beyond the periphery of said central heat-sink portion, said fastener means selectably cooperating with fastener provisions on said socket in allowing said composite heat-sink and cover means to move between the said open and closed positions and in releasably holding it closed over such a carrier.

4,679,119

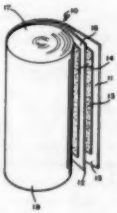
DIELECTRIC FLUID FOR ELECTRICAL CAPACITORS

Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jun. 13, 1986, Ser. No. 873,975

Int. Cl.⁴ H01G *4/22*

U.S. Cl. 361—315 **2 Claims**



1. In a capacitor, a dielectric fluid consisting of dioctyl phthalate and an addition of epoxidized linseed oil in an amount of from 0.1 to 30% by weight of the dioctyl phthalate

and a second additive of up to 0.05% by weight of an antioxidant.

4,679,120

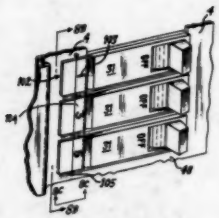
LIGHTING CIRCUIT BREAKER PANELBOARD MODULAR ASSEMBLY INCLUDING CIRCUIT BREAKER INDICATING CLIPS

Rodney D. Raabe; Joseph J. Mrowka; Jon P. McCuin, all of Bristol, and Joseph F. Noonan, Manchester, all of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 705,454, Feb. 25, 1985, Pat. No. 4,631,634. This application Aug. 4, 1986, Ser. No. 892,607

Int. Cl.[4] H02B *1/06*

U.S. Cl. 361—358 **2 Claims**



1. A circuit breaker panelboard assembly comprising:

closure means housing at least one main circuit breaker and a plurality of branch circuit breakers;

access means movably arranged on said closure means for providing access to said main and said branch circuit breakers from outside of said closure means;

mounting means within said closure supporting said branch circuit breakers and providing electrical connection between said branch circuit breakers and electrical bus bars within said closure means and connectable with an external circuit; and

shield means intermediate said access means and said main and branch circuit breakers preventing contact with electrical terminals on said main and branch circuit breakers;

said shield means further including a plurality of marking means carrying indicia to identify each of said branch circuit breakers, said marking means comprising plastic clips, each clip attached to opposing surfaces of said shield means.

4,679,121

ASSEMBLY SYSTEM FOR COMMUNICATIONS DEVICE HAVING PLUG-IN CIRCUIT BOARDS CONNECTED IN MULTIPLE STAGES

Josef Schomers, Backnang; Kurt Erbele, Weissach, and Wernfried Bonk, Auenwald, all of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jan. 24, 1986, Ser. No. 864,418

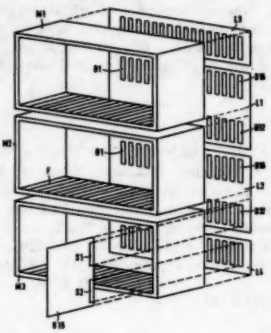
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 3502295

Int. Cl.[4] H05K *1/14*

U.S. Cl. 361—413 **3 Claims**

1. In an assembly system for an electrical device composed of plug-in circuit boards each having an edge and being provided with a plurality of plug-in connectors at such edge, the plug-in connectors presenting input and output terminals; a plurality of magazines each mounting a plurality of the plug-in circuit boards, the magazines each having a rear side and being disposed adjacent to one another, each plurality of plug-in circuit boards being mounted in a respective one of the magazines so that the plug-in connectors are located at the rear side; and rear wall circuit boards fastened to the rear sides of the magazines and including plug-in counterconnectors for mating with corresponding ones of the plug-in connectors at the edges of the plug-in circuit boards, wherein electrical connections are formed between input and output terminals of plug-in circuit boards located in adjacent magazines, the improvement wherein:

the plug-in connectors of each said plurality of plug-in circuit boards define separate regions at the rear side of each said magazine, and at least one rear wall circuit board is fastened to two adjacent magazines and covers only two adjacent ones of said regions, one each from said two



adjacent magazines; said plug-in counterconnectors each have a plurality of electrical contacts corresponding to said input and output terminals, respectively, of said plug-in connectors, and said rear wall circuit board includes conductor paths between selected contacts for forming the electrical connections between said input and output terminals; and respective ones of said input and output terminals of each said plug-in circuit board are associated with the connector of said plurality of connectors which is closest to the adjacent magazine to which the respective ones of said input and output terminals are connected.

4,679,122

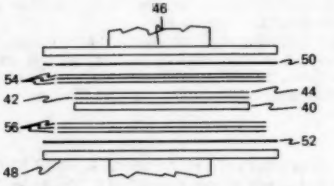
METAL CORE PRINTED CIRCUIT BOARD

Robert E. Belke, Jr., Clay; Raymond A. Shirk, North Syracuse; Hsiu H. Lin, Syracuse, and Louis Zakraysek, Cicero, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 658,744, Oct. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 455,109, Jan. 3, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 886,751

Int. Cl.[4] H05K *1/05*

U.S. Cl. 361—414 **15 Claims**



1. A printed circuit board for subsequent solder processing comprising:

(1) a planar thermally and electrically conductive metallic substrate;

(2) a layer of conductive metal foil patternable to form said electrical interconnections, and

(3) an insulating layer of polyetherimide thermoplastic resin, an engineering plastic based on bisphenol A dianhydride

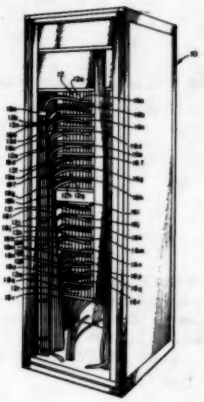
reacted with metaphenylene diamine, having a glass transition temperature in excess of 200 degrees C. to permit exposure to soldering not exceeding said temperature, said resin wetting metallic surfaces at temperatures in excess of said glass transition temperature which upon cooling to ambient temperatures forms a bond, said resin being bonded to said metal substrate and to said foil by high temperature wetting accompanied by pressure.

4,679,123

CABLE ORGANIZING AND PROTECTION SYSTEM AND METHOD

William K. Young, Norwalk, Conn., assignor to T-Bar Incorporated, Wilton, Conn.

Filed Mar. 10, 1986, Ser. No. 838,178
Int. Cl.[4] H02B *1/20*
U.S. Cl. 361—428 **12 Claims**



1. A cable organizing and protection system for use in high conductor density equipment comprising:

a frame for supporting equipment in at least one multi-level array wherein each component equipment is organized in a generally linear configuration within the array and a plurality of cables are connected into each component equipment, said frame providing entrance for cables and a clear cable path generally parallel to the array; and

at least one cable bundle retainer for each component equipment supported on the frame generally at the level of each component equipment to which that cable bundle is to be connected, said bundle retainers also being individually in a stepped array progressively outwardly from the component equipment such that the retainer most remote from the cable entrance is further from component equipment to which its supported cables are to be connected.

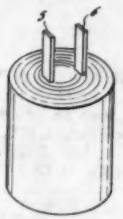
4,679,124

SOLID ELECTROLYTIC CAPACITORS

Susumu Yoshimura; Yasuo Kudoh, both of Yokohama; Soji Tsuchiya, Kanagawa; Toshikuni Kojima, and Shohzoh Takahashi, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 13, 1986, Ser. No. 818,592
Claims priority, application Japan, Jan. 14, 1985, 60-4288; Jan. 14, 1985, 60-4289; Jan. 14, 1985, 60-4290
Int. Cl.[4] H01G *9/05*
U.S. Cl. 361—433 **11 Claims**

1. In a solid electrolytic capacitor which comprises a valve metal anode anodized on the surfaces thereof, a cathode arranged in face-to-face relation with said anode, and a layer of a solid electrolyte formed between said anode and said cathode, the improvement characterized in that said electrolyte consists essentially of a complex salt of 2 molecules of 7,7,8,8-tetracyanoquinodimethane and one molecule of a cation selected from the group consisting of quinoline and isoquinoline



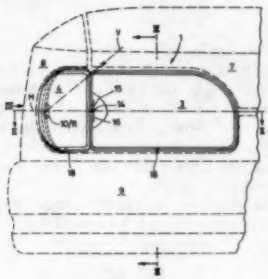
whose N position is substituted with an alkyl group having from 3 to 6 carbon atoms, and neutral 7,7,8,8-tetracyanoquinodimethane contained in an amount of from 5 to 100 parts by weight per 100 parts by weight of said complex salt.

4,679,125

HEADLAMP-INDICATOR UNIT FOR MOTOR VEHICLES

Heinz Dick, Odenthal, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1985, Ser. No. 761,226
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428467
Int. Cl.[4] F21V *3/18*
U.S. Cl. 362—66 **4 Claims**



1. A headlamp-indicator unit for assembly into the body of a motor vehicle, including a reflector unit having defined therein a pair of closed lamp chambers with corresponding reflector walls and openings for lamp sockets for a main headlamp and a flashing direction indicator positioned laterally outwardly from the main headlamp in the vehicle body intermediate the main headlamp in the side of the vehicle body proximate a front corner thereof, the chambers being covered by a corresponding diffusion and light lenses respectively, the headlamp-indicator unit being adjustable through adjustment means interposed between the unit and the body of the motor vehicle, both about a horizontal and about a generally vertical pivot axis, characterized in that the headlamp indicator unit is in part supported by a rounded supporting edge formed as a protrusion on a front fender portion of the vehicle body and a corresponding supporting groove formed on an adjacent portion of the reflector unit which receives the supporting edge in a support plane generally parallel to the longitudinal median plane of the vehicle, the edge in the groove being located on the intersection of the plane and an arc having a center of curvature on the horizontal pivot axis, and in that the light lens of the flashing direction indicator is extended around the front

corner of the vehicle body and, as viewed from the side of the motor vehicle body, has a rear edge having an arcuate profile which matches and is concentric with a corresponding receiving recess formed in the adjacent fender portion of the vehicle body.

4,679,126

MINIATURE LAMP ARRAYS HAVING IMPROVED LAMP RETENTION FEATURES

Robert H. Van Sickler, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1986, Ser. No. 820,774

Int. Cl.[4] H01R *33/00*

U.S. Cl. 362—226 **15 Claims**

1. A decorative string set comprising;

(a) a plurality of incandescent lamps, each having lead-in wires and a plug-in base having an upper rim;

(b) a plurality of housings spaced along said decorative stiring set, said housings having affixed therein electrical sockets providing a first means for complementary acceptance and respective connection to said lead-in wires of said incandescent lamps;

(c) a separate means for locking the connection of said lamps having said plug-in base to said sockets.

4,679,127

HEADLIGHT FOR MOTOR VEHICLES

Hans-Otto Ernst, Lippstadt, and Helmut Jakobsmeyer, Paderborn-Elsen, both of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

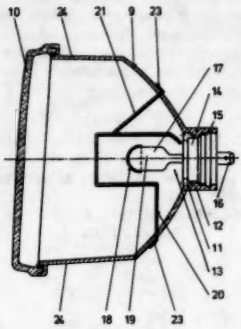
Filed Sep. 22, 1986, Ser. No. 910,397

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540130

Int. Cl.[4] F21V *29/00*

U.S. Cl. 362—294 **11 Claims**

1. A headlight for motor vehicles comprising: a reflector with a vertex and an opening in said vertex; a cover plate covering said reflector; an incandescent lamp fitting in said opening in said vertex; a substantially U-shaped enclosure comprised of sheet metal and positioned in vicinity of said lamp; flanks on said enclosure; a web between said lamp and said cover plate for connecting said flanks, said flanks extending above and below said lamp without contacting said lamp after assembly of said headlight; sections on said reflector generating diffused light, one flank comprising a screen for screening off said sections of said reflector; one of said flanks being positioned below said lamp and comprising substantially a supporting arm for said enclosure; another one of said flanks being positioned above said lamp and having a free terminal section; a base on said lamp screened off by said free terminal section; a tongue punched and bent out of an area of said U-shaped enclosure between said lamp and said cover plate,



said tongue comprising an upper supporting arm securable to said reflector.

4,679,128

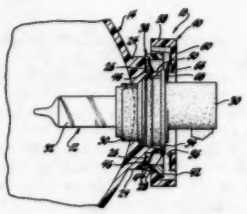
HEADLAMP BULB RETAINING ARRANGEMENT

Paul D. Van Duyn, and John D. Geddie, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1986, Ser. No. 888,990

Int. Cl.[4] F21V *7/00*

U.S. Cl. 362—306 **3 Claims**

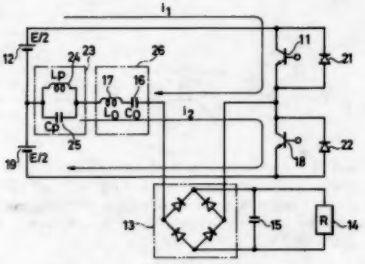


1. A retaining arrangement for maintaining a bulb assembly within a socket located in the rear of a vehicle headlamp reflector, said bulb assembly having an annular flange, said socket being defined by a cylindrical boss having an opening for receiving said bulb assembly with said flange located in a predetermined angular position in engagement with the terminal end of said boss, said retaining arrangement including a grip member in the form of a ring having a plurality of blades extending radially inwardly from said grip member for permitting said grip member to be press fitted onto said cylindrical boss and maintained thereon, a plurality of circumferentially spaced lock tabs formed on the peripheral surface of said grip member, and an annular lock nut having a plurality of cam slots formed therein, a plurality of radially inwardly extending spring fingers formed with said lock nut, said lock nut adapted to be mounted on said grip member so that the cam slots receive the lock tabs after which the lock nut is rotated causing said lock nut to move axially towards said grip member and through said spring fingers press the flange of said bulb firmly into engagement with said terminal end of said boss.

4,679,129
SERIES RESONANT CONVERTER

Kazuhiko Sakakibara, Tokorozawa, and Yutaka Kuwata, Kodaira, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed May 5, 1986, Ser. No. 859,680
Claims priority, application Japan, May 10, 1985, 60-98997; Mar. 3, 1986, 61-45725; Apr. 28, 1986, 61-99807
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—17 20 Claims

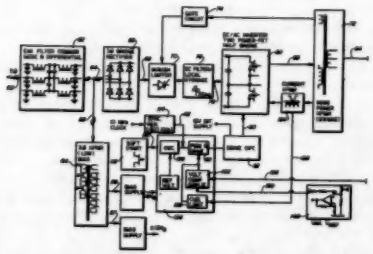


1. A series resonant converter comprising:
a first series resonant loop including a first switch element;
a second series resonant loop including a second switch element;
series resonant means inserted in said first and second series resonant loops and having a frequency significantly higher than an audible frequency range;
a rectifier inserted commonly in said first and second series resonant loops in series thereto;
power supply means for causing current through said first series resonant loop through control of said first switch element and causing current through said second series resonant loop through control of said second switch element; and
parallel resonant means inserted in said first and second series resonant loops in series with said series resonant means and having a parallel resonant frequency significantly lower than the series resonant frequency of said first and second series resonant loops and slightly higher than the audible frequency range.

4,679,130
PROGRAMMABLE POWER SUPPLY

Poldi Moscovici, Woodcliff Lake, N.J., assignor to Superior Manufacturing & Instrument Corporation, Maspeth, N.Y.

Filed Jun. 4, 1986, Ser. No. 870,379
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—17 30 Claims

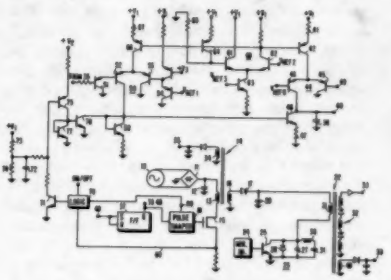


1. A programmable power supply which comprises:
a switching power supply having an output;
said switching power supply including a pulse modulator, a main power transformer, and means responsive to said pulse modulator for varying the input to the main power transformer;
a linear power supply having an output;
said linear power supply including an active element coupled to the output of said switching power supply;
first feedback means responsive to the output of the active element for providing a first feedback signal;
means for providing a voltage programming signal representing the voltage to be programmed;
means for controlling the active element in response to said first feedback signal and said voltage programming signal;
means for controlling said pulse modulator;
second feedback means for providing a second feedback signal responsive to the voltage drop across said active element;
said pulse modulator contol means being responsive to said first feedback signal and said second feedback signal; and
means for controlling the output from said switching power supply in response to the output from said pulse modulator.

4,679,131
REGULATING POWER SUPPLY FOR VIDEO DISPLAY APPARATUS

Paul D. Filliman, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed May 10, 1985, Ser. No. 733,447
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—21 9 Claims



1. A power supply for a video display apparatus comprising:
a source of unregulated voltage;
a transformer winding;
switch means for coupling said source of unregulated voltage to said transformer winding in response to input pulses; and
a pulse generator coupled to said switch means comprising:
a source of current providing a predetermined current level;
a first current path including a capacitor;
a second current path coupled to said first current path;
means, responsive to the voltage level across said capacitor, for coupling said source of current to said first and second current paths when said capacitor is discharged below a first predetermined voltage level for charging said capacitor and for uncoupling said source of current from said first and second current paths when said capacitor is charged above a second predetermined voltage level; and means responsive to a reference voltage level for controlling the amount of current flow through said second current path, in order to divert a controlled amount of charging current away from said capacitor when said source of current is coupled to said first and second current paths, for controlling the charging time of said capacitor, said second current path discharging said capacitor when said source of

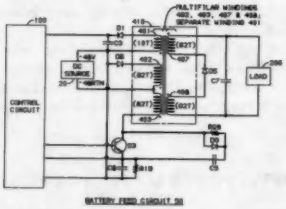
current is uncoupled from said first and second current paths, said control means controlling the discharge time of said capacitor.

4,679,132

FLOATING BATTERY FEED CIRCUIT USING MULTIFILAR TRANSFORMER

Howard F. Jirka, Crystal Lake, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 8, 1985, Ser. No. 763,668
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **13 Claims**



1. A battery feed circuit for supplying power from a source of potential having first and second terminals, to an electrical load having first and second terminals, said circuit comprising

transformer means comprising first, second, third and fourth magnetically coupled winding means multifilar wound around a single core, each of said first, second, third and fourth winding means having a first polarity end and a second polarity end, the second polarity end of said first winding means and the first polarity end of said second winding means both being connectible to said first terminal of said source, the first polarity end of said third winding means being connectible to the second polarity end of said fourth winding means, the second polarity end of said third winding means being connectible to said first terminal of said load, and the first polarity end of said fourth winding means being connectible to said second terminal of said load,

switching means operative for cyclically connecting the first polarity end of said first winding means to said second terminal of said source, and

unidirectional current means serially connected with said third and fourth winding means for allowing only unidirectional current flow through said third and fourth winding means for supplying power to said load;

whereby an electrical noise component coupled, during said cyclic connecting by said switching means, from said first winding means to said load, is reduced by an opposite polarity electrical noise component coupled from said second winding means to said load.

4,679,133

SYSTEM FOR ALLEVIATING HARMONIC DISTORTION

Poldi Moscovici, Woodcliff Lake, N.J., assignor to Superior Manufacturing & Instrument Corporation, Maspeth, N.Y.

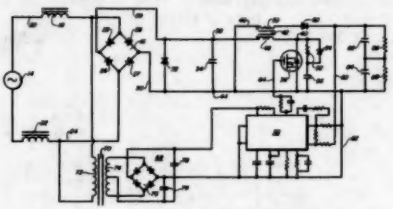
Filed Jun. 4, 1986, Ser. No. 870,378
Int. Cl.[4] H02M *1/12*
U.S. Cl. 363—46 **15 Claims**

1. In a power supply having an AC input waveform with a first frequency, a full wave rectifier having an output for providing rectified voltage, and a filter capacitor, a system for alleviating harmonic distortion to fill in gaps between voltage and current, which comprises:

means for chopping the rectified voltage at a frequency cycle that is higher than the first frequency and with the higher frequency cycle having a positive portion and a negative portion;

timing means for providing said higher frequency cycle;

an inductor device for storing the chopped and rectified voltage during one of the positive and negative portions of the higher frequency cycle; and



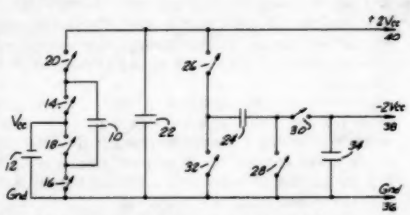
means for transferring stored energy from the inductor device to the filter capacitor during the other of the positive and negative portions of said higher frequency cycle, whereby the gaps between voltage and current are substantially filled in.

4,679,134

INTEGRATED DUAL CHARGE PUMP POWER SUPPLY AND RS-232 TRANSMITTER/RECEIVER

David Bingham, San Jose, and Charles M. Allen, Sunnyvale, both of Calif., assignors to Maxim Integrated Products, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 782,953, Oct. 1, 1985. This application Jun. 25, 1986, Ser. No. 878,233
Int. Cl.[4] H02M *3/18*
U.S. Cl. 363—61 **2 Claims**



1. A circuit, integrable on a single piece of semiconductor substrate material, for providing a bipolar voltage output at substantially double the voltage of a unipolar voltage input source, including:

first and second voltage input terminals,

first and second positive transfer capacitor connection terminals,

a first set of MOS semiconductor switches for selectively connecting said first voltage input terminal to said first and second positive transfer capacitor connection terminal and said second voltage input terminal to said second positive transfer capacitor connection terminal,

first and second positive reservoir capacitor connection terminals,

a second set of MOS semiconductor switches for selectively connecting said first voltage input terminal to said second positive transfer capacitor connection terminal and for selectively connecting said second voltage input terminal to said first positive reservoir capacitor connection terminal and said first positive transfer capacitor connection terminal to said second positive reservoir capacitor connection terminal,

first and second negative transfer capacitor connection terminals,

a third set of MOS semiconductor switches for selectively

connecting said first positive reservoir capacitor connection terminal to said first negative transfer capacitor connection terminal and said second positive reservoir capacitor connection terminal to said second negative transfer capacitor connection terminal,

first and second negative reservoir capacitor connection terminals, said first negative reservoir capacitor connection terminal connected to said first positive reservoir capacitor connection terminal,

a fourth set of MOS semiconductor switches for selectively connecting said first negative transfer capacitor connection terminal to said second negative reservoir capacitor connection terminal and second negative transfer capacitor connection terminal to said first negative reservoir capacitor connection terminal,

selection circuitry for selectively activating said first, second, third and fourth sets of MOS semiconductor switches,

means for clamping said second positive reservoir capacitor terminal to a voltage no more negative than a voltage approximately equal to the voltage appearing on said first voltage input terminal,

means for clamping said second negative reservoir capacitor to a voltage no more positive than a voltage approximately equal to the voltage appearing on said second voltage input terminal,

means for inhibiting latch-up of forward biased four layer devices created as a result of layout of said circuit on a single piece of semiconductor substrate material,

at least one RS-232 transmitter circuit, disposed in said semiconductor substrate material, having positive, negative and ground potential power conductors connected to said second positive reservoir capacitor terminal, said second negative reservoir capacitor connection terminal, and said first positive reservoir capacitor terminal, respectively, a data input connection terminal connected to said transmitter circuit for providing data to said transmitter, and a data output terminal connection for providing an output from said transmitter.

4,679,135

CONTROL APPARATUS

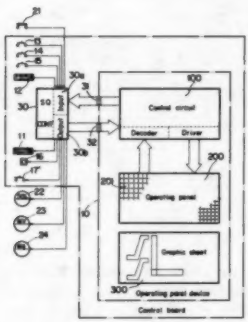
Takeshi Kobayashi, Hadano; Ryouichi Ishii, and Tomoyoshi Kitamoto, both of Hiratsuka, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,356

Claims priority, application Japan, Dec. 26, 1983, 58-243776

Int. Cl.[4] G05B *19/10, 23/02, 19/02*

U.S. Cl. 364—146 **7 Claims**



1. A control apparatus comprising:

an operating panel means having illuminable switches which produce operation data upon operation by an operator and which display by illumination the status of operation of a machine equipment to be controlled, and

an external control means which controls the machine equipment in a sequential manner according to a predetermined program on the basis of the operation data provided from said operating panel means and detection signals provided from the machine equipment and which illuminates the illuminable switches of said operating panel means,

said operating panel means having an operating panel composed of a large number of said illuminable switches arranged in a matrix form,

wherein a specific operation data is produced by operation of a predetermined illuminable switch in said operating panel and the status of operation of the machine equipment is displayed by illumination of the operated illuminable switch and

wherein said operating panel means is further provided with a storage means for temperarily storing the operation data produced by the operation of the illuminable switches and illumination data for specifying the illuminable switch to be illuminated, and a control section which controls the write and read of data to and from said storage means in accordance with a predetermined program and which controls in accordance with a predetermined program the delivery of the operation data stored in said storage means to said external control means and illumination of the illuminable switches based on the ilumination data stored in said storage means.

4,679,136

DYNAMIC ERROR COMPENSATING PROCESS CONTROLLER

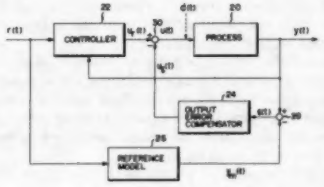
Takashi Shigemasa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 10, 1985, Ser. No. 690,259

Claims priority, application Japan, Apr. 13, 1984, 59-73982; Apr. 13, 1984, 59-73983; Apr. 13, 1984, 59-73984

Int. Cl.[4] G05B *13/04, 13/02, 13/00*

U.S. Cl. 364—150 **6 Claims**



1. A process control apparatus comprising:

controller means for performing a control operation including an integral operation for a set point signal supplied to a process and an output signal from the process;

a reference model having a desired transfer function of a control system including said process and said controller means and receiving the set point signal;

first subtracting means for subtracting an output signal of the reference model from the output signal of said process to obtain an output error;

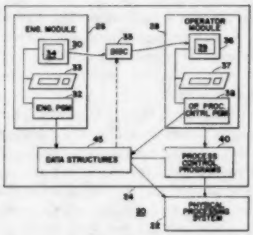
output error compensating means for performing control operation including an integral operation for an output error generated from said first subtracting means and for generating a compensation signal such that the output error becomes zero; and

second subtracting means for subtracting an output of said output error compensating means from an output of said controller means and for supplying a subtraction result as a control signal to said process.

4,679,137
PROCESS CONTROL INTERFACE SYSTEM FOR DESIGNER AND OPERATOR

Leslie A. Lane, Santa Clara; Lynn V. Lybeck, Moss Beach; David S. Perloff, Sunnyvale, and Chester L. Mallory, Campbell, all of Calif., assignors to Prometrix Corporation, Santa Clara, Calif.

Filed Apr. 30, 1985, Ser. No. 729,153
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—188 **32 Claims**



18. In a method for displaying and selecting menu items on a computer display device, the steps of:

defining a plurality of separate main menu items;

defining a plurality of separate groups of auxiliary menu items, each being associated with at least one of said main menu items;

establishing at least three separate menu display regions on said computer display device, each being capable of displaying multiple menu items and an associated selectably positionable pointer to an individual menu item;

displaying in a first one of said menu display regions at least a plurality of said main menu items together with said associatedd pointer positioned at one of said displayed main menu items;

displaying simultaneously in a second one of said menu display regions at least a portion of one of said groups of auxiliary menu items associated with the main menu item being selected at in said first menu display region together with said associated pointer positions at one of said displayed auxiliary menu items;

automatically responding to a position change of said pointer in said first menu display region to point at a new main menu item by altering said second menu display region to display at least a portion of one of said groups of auxiliary menu items associated with the new main menu item being pointed at;

defining a plurality of groups of tertiary menu items, each group being associated with at least one of said auxilary menu items; and

displaying simultaneously in a third one of said menu display regions at least a portion of one of said groups of tertiary menu items associated with said auxiliary menu item being pointed at in said second menu display regions together with said associated pointer positioned at one of said displayed tertiary menu items;

wherein

said step of automatically responding to a position change of said poiner in said first menu display region further includes the step of simultaneously altering said third menu display region to display at least a portion of one of said groups of tertiary menu items associated with said second menu item being pointed at in said second display region; and

said method further includes the step of automatically responding to a position change of said pointer in said second menu display region without a position change of said pointer in said first menu display region by simultaneously altering said third menu display region to display at least a portion of one of said groups of tertiary menu items associated with said new secondary menu item being pointed at in said second display region.

27. In a method of controlling a process using a programmed digital computer, the steps of:

(a) establishing a set of process control programs, each having associated therewith a set of predefined parameters required for its operation;

(b) defining a parameter data structure format for each of said process control programs, including

parameter denoting means for denoting each of said predefined parameters as an operator unalterable parameter having a fixed value, an operator alterable parameter having a default value, or a forced operator entry parameter that must be supplied with a value before the process is run; and

parameter value storing means for storing a value for each of said predefined parameters;

(c) storing, for each of a multiplicity of specified processes, a parameter data structure in accordance with the parameter data structure format for a specified one of said process control programs;

(d) entering into said parameter denoting means of said parameter data structure for a specified process a value for each of said predefined parameters to specify it as an operator unalterable parameter, an operator alterable parameter, or a forced operator entry parameter;

(e) entering fixed values for said operator unalterable parameters and default values for said operator alterable parameters;

(f) selecting one of said processes;

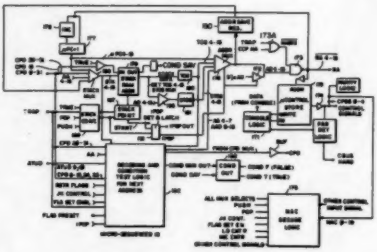
(g) entering values for said operator alterable and forced operator entry parameters for said selected process; and

(h) enabling the running of the process control program corresponding to said selected process only after values have been entered for all said forced operator entry parameters corresponding to said selected process.

4,679,138
MICROSEQUENCER IN A DATA PROCESSING SYSTEM USING STACK STORAGE FOR CONTROLLING THE SEQUENCING OF MICROROUTINES

David I. Epstein, Framingham, and Charles J. Holland, Northboro, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 23, 1981, Ser. No. 256,714
Int. Cl.[4] G06F *9/22*
U.S. Cl. 364—200 **8 Claims**



1. In a data processing system having macroinstruction decodeing means for decoding a macroinstruction to provide a sequence of microinstructions comprising one or more microroutines, a microsequencing control means for controlling the provision of said sequence of microinstructions, said microsequencing control means including

stack storage means for temporarily storing data for use in said microroutines, the final microinstruction of a mi-

croroutine being a request to retrieve or remove data from said stack storage means;

first logic means connected to said stack storage means and responsive to the data request of the final microinstruction of a microroutine for producing a stack empty signal when no data remains in said storage means; and

second logic means connected to said first logic means and responsive to said stack empty signal and to said data request for generating an output signal for requesting a new macroinstruction.

4,679,139

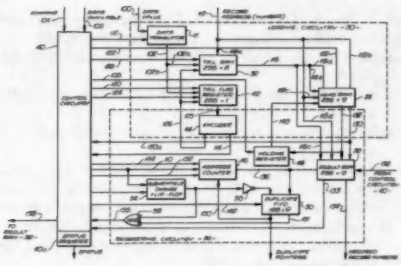
METHOD AND SYSTEM FOR DETERMINATION OF DATA RECORD ORDER BASED ON KEYFIELD VALUES

James W. Durbin, Fortuna, Calif., assignor to Canevari Timber Co., Inc., Fortuna, Calif.

Filed May 1, 1984, Ser. No. 605,788

Int. Cl.[4] G06F *7/22, 12/00*

U.S. Cl. 364—200 **27 Claims**



14. A system for arranging record numbers corresponding to a plurality of data records wherein each record is comprised of a plurality of bits and is identified by a unique record number, wherein a portion of each record comprises a keyfield, wherein each keyfield is divided into a plurality of sub-keyfields, each of said sub-keyfields having a different order of significance, and wherein the record numbers of the plurality of records are arranged in accordance with the value of said keyfields, said system comprising:

a. intermediate storage means including:

(i) a head memory means having a plurality of individually accessible storage areas, wherein each individually accessible storage area has a location address corresponding to a different record number; and

(ii) a tail memory means having a plurality of individually accessible storage areas, wherein each individually accessible storage area has a location address corresponding to a different subkeyfield value;

b. first control means for receiving the record number and sub-keyfield value of each record in a group of records, and, for each unique subkeyfield value received:

(i) for the first record number received that is assocaited with such sub-keyfield value, for loading the record number into the storage area of the tail memory means having a location address corresponding to the sub-keyfield value and also into the storage area of the head memory means having a location address corresponding to said first record number; and

(ii) for all subsequent record numbers received that are associated with such sub-keyfield value, for loading the record number currently stored in the storage area of the tail memory means having a location address corresponding to the sub-keyfield value, into the storage area of the head memory means having a location address corresponding to said subsequent record number, and for loading said subsequent record number into the storage area of the tail memory means having a location address corresponding to the sub-keyfield value.

c. Second control means for successively accessing from the intermediate storage means, for each storage area of the tail memory means having a record number stored therein in accordance with the location addresses of said storage areas which correspond to the sub-keyfield values, a group of one or more record numbers, wherein the first record number in the group is accessed from the storage area of the tail memory menas having a location address corresponding to that sub-keyfield value, and wherein each succeeding record number in the group is accessed from the storage area of the head memory means having a location address corresponding to the immediately preceding record number;

d. final memory means having a plurality of individually accessible storage areas each having a different location address;

e. third control means including a receiving means for receiving an address from a fourth control means, a loading means for loading each record number accessed by the second control means in the order accessed into consecutive storage areas of the final memory means, and a recording means for recording, for each group of mroe than one record number accessed by the second control means, each record number in the group and the location address of the storage area of the final memory means where the first record number in the group is loaded; and

f. fourth control means for initially providing, for each reocrd, the record number and sub-keyfield value of greatest significance of that record to the first control means and the location address of the first storage area of the final memory means to the third control means, and, for subsequently providing, separately for each group of more than one record number recorded by the third control means, each record number in the group and its corresponding sub-keyfield value of next greatest significance to the first control means and the location address of the storage area of the final memory means recorded for the group by the third control means.

4,679,140

DATA PROCESSOR WITH CONTROL OF THE SIGNIFICANT BIT LENGTHS OF GENERAL PURPOSE REGISTERS

Shizuo Gotou, Hachiouji; Toyohiko Kagimasa, Kokubunji; Seiichi Yoshizumi, Hino, all of Japan, and Yooichi Shintani, Pittsburgh, Pa., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,785

Claims priority, application Japan, Dec. 23, 1983, 58-242018; Oct. 3, 1984, 59-206235

Int. Cl.[4] G06F *12/04*

U.S. Cl. 364—200 **13 Claims**

1. A data processor for performing data processing operations in response to program instructions, comprising:

a plurality of general registers, each having a first predetermined bit length;

mode signal storage means for holding a plurality of mode signals each indicating a significant bit length for data stored in a respective one of said general registers;

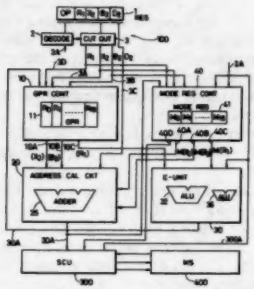
mode reading means responsive to a program instruction for reading out of said mode signal storage means at least one mode signal corresponding to one of the general registers designated by the program instruction as one which should be accessed for read-out or write-in of data;

register accessing means connected to said general registers and responsive to program instructions for accessing selected ones of said general registers to read-out or write-in data;

data use means connected to said general registers for processing data from one of the general registers accessed by said register accessing means in response to a program instruction which requests a read-out of data from the

general registers, including means responsive to a first mode signal read out by said mode reading means in response to the program instruction for changing the significant bit length of the data read out from a first general reegister adding bits thereto; and

data supply means connected to said general registers for writing data in one of the general registers accessed by



said register accessing means in response to a program instruction which requests write-in of data in said general registers, including means responsive to a second mode signal read out by said mode reading means in response to the program instruction for changing the significant bit length of the data to be written into the general register by adding bits thereto.

4,679,141

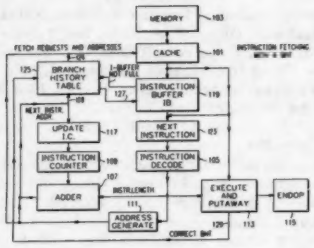
PAGEABLE BRANCH HISTORY TABLE

James H. Pomerene, Chappaqua, N.Y.; Thomas R. Puzak, Cary, N.C.; Rudolph N. Rechtschaffen, Scardsale; Philip L. Rosenfeld, Briarcliff Manor, both of N.Y., and Frank J. Sparacio, North Bergen, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,424

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **7 Claims**



1. In a branch history table which is divided into two sections, with groups of instructions being divided into segments and with the branch information for a segment forming a segment entry, the combination comprising:

an active high speed section in which n, where n is an integer, segment entries are stored, including means for processing branch information in said segment entries;

a slower speed backup section which stores the remaining segment entries of said branch history table; and

means for updating the active high speed section from the slower speed section based on analyzing branch information in segment entries to determine entries to be used in the future.

4,679,142

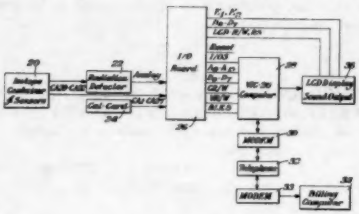
RADIOACTIVE MATERIAL BILLING SYSTEM AND METHOD

Denny L. Y. Lee, Andover, Mass., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 2, 1984, Ser. No. 627,867

Int. Cl.[4] G01R *21/00*; G06F *15/20, 15/24*

U.S. Cl. 364—406 **19 Claims**



1. A system for billing based on the usage of radioactive material held in a dispensing container comprising:

a radiation shielded chamber adapted to receive the container,

a sensor for providing a signal each time the chamber is accessed,

a detector means for detecting radiation emitted from the container while in the chamber,

a control unit responsive to the sensor and detector means for measuring the level of radiation in the container (a) periodically and (b) each time the chamber is accessed,

memory means responsive to the control unit for storing each of the radiation measurements together with the time of the access event, and

means responsive to the control unit and memory means for calculating the radioactive material actually removed from the container based on the periodic and access measurements.

14. A method of measuring dispensed doses of a radioactive material from a dispensing container adapted to be held in a shielded chamber with a removable access lid using a radiation detector to measure radioactivity in the chamber comprising the steps of:

first measuring the radioactivity in the chamber when a dispensing container is first loaded into the chamber,

recording the first measurement and its time and date,

second measuring the radioactivity in the chamber each time the lid is removed,

recording each second measurement and its time and date,

third measuring the radioactivity in the chamber each time the lid restored on the chamber,

recording each third measurement and its time and date, and

calculating the radioactive material actually used based on such measurements.

4,679,143

CONTROL DEVICE FOR GAME MACHINE

Takashi Hagiwara, Zama, Japan, assignor to Sigma Enterprises, Inc., Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,677

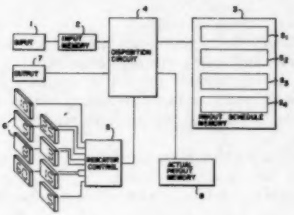
Claims priority, application Japan, Nov. 29, 1982, 57-208849

Int. Cl.[4] G07F *17/34*; A63F *5/04, 7/00*; G06F *15/44*

U.S. Cl. 364—412 **8 Claims**

1. Apparatus for providing a specific payout based on a predetermined payout schedule comprising input means for a player to select a selected object of a plurality of objects in a first payout schedule, disposition means for receiving a signal indicative of said selected object and determining whether the selected object results in a payout in accordance with said first payout schedule, means connected to said disposition means for determining the actual payout history of the apparatus,

memory means connected to said disposition means for recording a plurality of payout schedules, each of said payout schedules having a payout for each of a plurality of objects, the total payout for each schedule being different from the total payout for each of the other schedules, display means for showing



each payout corresponding to each object in a present payout schedule, said disposition means comparing said actual payout history with a predetermined limit and replacing said first payout schedule with a second payout schedule if said actual payout history exceeds said limit.

4,679,144

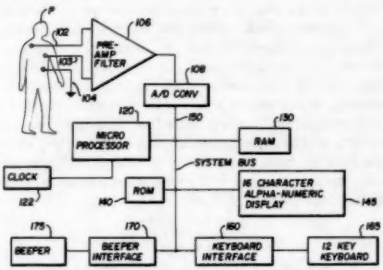
CARDIAC SIGNAL REAL TIME MONITOR AND METHOD OF ANALYSIS

Michael W. Cox, Lincroft, N.J.; Richard I. Levin, New York, N.Y.; David J. Cohen, Sag Harbor, N.Y., and William R. Frisbie, East Hampton, N.Y., assignors to Q-Med, Inc., Clark, N.J.

Filed Aug. 21, 1984, Ser. No. 642,690

Int. Cl.[4] G06F *15/42;* **G06G** *7/60;* **A61B** *5/04*

U.S. Cl. 364—417 **40 Claims**



1. A method of evaluating a curve having a rapidly changing value by determining the positive or negative quality of the slope of said curve and by determining when the value of said curve is above or below a predetermined threshold value, comprising the steps of:

determining a frequency of sampling;

determining the slope of the curve between a first sampling and a successive later sampling by substracting the value of the curve at each first sampling from the value of the curve at said later sampling;

providing four shift registers each having space for a plurality of bits and for a Flag Bit;

assigning a shift register to each of the curve values of positive slope, negative slope, above threshold and below threshold;

feeding an appropriate bit value to each shift register at each sampling;

determining a numerical value represented by said plurality of bits arrayed in each shift register;

providing a table of values correlating the status of said Flag Bit to each one of the numerical values possibly represented by said array of bits;

finding said determined numerical value in said table;

changing, as needed, the status of said Flag Bit in accordance with said determined numerical value found in said table; and

performing at each sampling said sequence of steps so that the status of said Flag Bit may be changed as needed.

4,679,145

METHOD AND APPARATUS FOR CONTROLLING A CLUTCH-TRANSMISSION UNIT

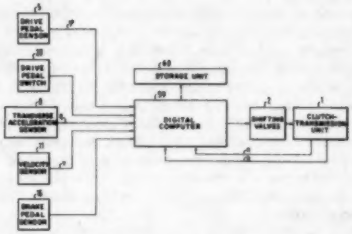
Peter op de Beeck, Nokere, Belgium; Rainer Wuest, Wiesheim, and Norbert Stelter, Weissach, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,612

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1983, 3341652

Int. Cl.[4] B60K *41/08;* **G06F** *15/20*

U.S. Cl. 364—424.1 **40 Claims**



26. An apparatus for the control of a clutch transmission unit of a vehicle equipped with an internal combustion engine, in which the internal combustion engine is adapted to be influenced by a drive pedal, comprising

drive pedal computer means operable to scan drive pedal signal values, to continuously update the drive pedal signal values scanned over scanning intervals and stored in a first memory means, and to calculate from said drive pedal values the drive pedal activity,

first characteristic curve converter means for changing the limit values of shifting decisions as a function of the drive pedal activity,

sensor means for detecting signals indicative of at least several of transverse acceleration, braking operation, coasting operation, vehicle velocity from which a deceleration signal is obtained by means of a differentiator, transmission output rotational speed and the engaged gear,

transmission translator means for deriving, from the transmission output rotational speed and the engaged gear, the signals of transmission input rotational speed, transmission input rotational speed in the next higher gear and transmission input speed in the next lower gear,

second characteristic curve converter means for producing a desired output value signal determined from the drive pedal position,

program control means for controlling a clutch transmission unit,

means for processing said detected and calculated signals and applying the processed signals to said program control means, and

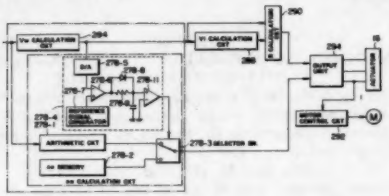
means for determining the waiting period for a shifting-up operation which is determined by a third characteristic curve converter means from the drive pedal activity and is applied to the program control means.

4,679,146

ANTI-SKID BRAKE CONTROL SYSTEM AND METHOD FEATURING VEHICLE BATTERY PROTECTION

Jun Kubo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 17, 1984, Ser. No. 601,293
Claims priority, application Japan, May 16, 1983, 58-84092
Int. Cl.[4] B60T *8/34*
U.S. Cl. 364—426 **8 Claims**



1. An anti-skid brake control system for an automotive vehicle comprising:

a hydraulic brake circuit including a wheel cylinder for applying braking pressure to a vehicle wheel;

a pressure control valve disposed within said hydraulic brake circuit for increasing the fluid pressure in said wheel cylinder in a first position thereof, decreasing the fluid pressure in a second position thereof and holding the fluid pressure constant value in a third position thereof;

first means for detecting wheel speed and producing a first signal having a value representative of the wheel speed;

a second means for detecting wheel acceleration producing a second signal having a value representative of the wheel acceleration;

a third means for deriving a control signal for selecting one of said first, second and third positions of said pressure control valve based on said first and second signals, said third means producing said control signal to place said pressure control valve at said second position when said second signal value decreases smaller than a given deceleration threshold;

a fourth means, receiving said first signal, for producing a command to replace said second signal value with a predetermined value which is greater than said deceleration threshold, when said first signal value becomes less than a given wheel speed threshold; and

a fifth means responsive to increases of said first signal above said wheel speed threshold to disable said fourth means for a predetermined period of time after the first signal value has exceeded the wheel speed threshold.

4,679,147

NAVIGATION SYSTEM WITH CAPABILITY OF INSTRUCTING RUNNING DIRECTION

Fumio Tsujii; Yoji Matsuoka, both of Mito; Takanori Shibata, Hitachi; Akira Endo, Mito, and Hiroshi Shirai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,259
Claims priority, application Japan, Mar. 28, 1984, 59-58301
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 **7 Claims**

1. A navigation system for displaying, on a display screen, road map information and a running trace of a car superimposed thereon comprising:

display means including a cathode ray tube for displaying road map information and information regarding the car running trace;

at least one bearing sensor means for detecting the running direction of the car;

running distance detector means for detecting the running distance of the car; and

control means, connected to receive output signals from said bearing sensor means and said running distance detector means, for computing a current position of the car, for controlling car running information. such as the road map information, a running trace and a running bearing corresponding to the current position of the car, and for displaying the car running information on said cathode ray tube,

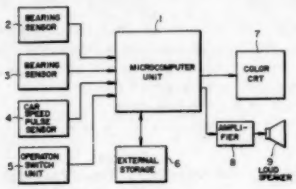
said control means including:

(a) external storage means for storing the road map information and the car running information;

(b) a central control unit for controlling said external storage means, said computation of the current position of the car and said display of the road map information; and

(c) means for instructing the driver as to the desired running direction; and wherein:

said central control unit comprises means for setting specified areas centered on respective crossings of roads on said road map information stored in said external storage means, means for calculating a running position of the car in accordance with the output signals of said bearing sensor means and said running distance detector means, means for detecting the arrival of the car at an entrance of the specified area by comparing the calculated value of the running position with data indicating the boundary of the specified area, means for determining the angular difference between the current running direction of the car and a destination bearing at the entrance of the specified area in accordance with the output signal of said bearing sensor means at said entrance and information of the destination bearing stored in said external storage means, and means for controlling said running direction instructing means to indicate to the driver the desired running direction at a crossing in accordance with said determined angular difference.

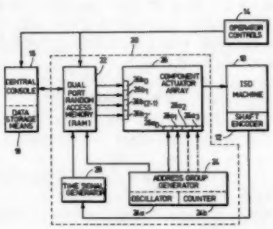


4,679,148

GLASS MACHINE CONTROLLER

Charles L. Wood, Muncie, Ind., assignor to Ball Corporation, Ind.

Filed May 1, 1985, Ser. No. 729,394
Int. Cl.[4] C03B *9/40*; G06F *15/46*
U.S. Cl. 364—473 **4 Claims**



1. A programmable automatic controller for controlling at least one section of a glassware-forming machine including a

plurality of movable components that operate in timed relationship with respect to one another to form rigid glassware articles from gobs of molten glass, comprising

means for generating digital indications of the increments of time elapsed in each cycle of operation of the machine;

a dual port random access memory with sufficient memory locations for storing the on/off statuses of each of the plural machine components in each increment of time in each cycle of operation of the machine, said memory providing grouped memory locations to provide multiple address locations in the memory for each increment of time and having two separate sets of input/output ports allowing independent and substantially simultaneous storage and retrieval for each of the memory locations;

an address group generator to develop a series of sequential address group signals in each increment of time to permit differentiation between the groups of plural components stored in the random access memory during each increment of time;

a plurality of component actuators, said component actuators being connected in plural groups with each plural group sharing a common activating terminal, and with one component actuator in each plural group sharing a common actuating terminal, said activating terminals of each group being connected with the address group generator and said shared actuating terminals of the component actuators being connected with the output ports of the random access memory;

wherein each of the machine components may be efficiently actuated by the on/off status stored in tne random access memory in each increment of time.

4,679,149
COMMISSIONING SYSTEM

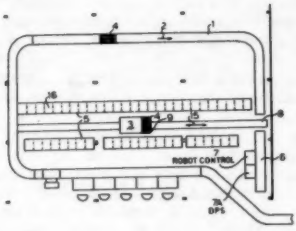
Arthur Merz, Bad Hersfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,569

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408081

Int. Cl.[4] G06F *15/24*

U.S. Cl. 364—478 **4 Claims**



1. In a commissioning system including: a rack with deposition compartments; a transport unit for loading the deposition compartments with individual articles provided with machine readable coding; and code readers and computers for controlling the distribution of the articles, the improvement comprising:

(a) the transport unit having disposed thereon and transportable therewith an industrial robot, a code reader and a receptacle for a multiplicity of said articles with readable coding;

(b) a controller for said transport unit and robot;

(c) said controller programmed to issue a command to said robot to cause it to grab one of the articles from said loaded receptacle and position it with its coding in front of said code reader;

(d) said controller programmed to derive from the coding read, a travel command for the transport unit and the robot to a respective deposition compartment;

(e) means for, simultaneously with the execution of the travel command, transferring the coding read to a data processing system;

(f) said controller responsive to an output from said data processing system after the travel command is executed and a destination address is received, which is determined by the data processing system on the basis of plausibility, to cause the industrial robot to deposit the grabbed material in the respective compartment; and

(g) said controller programmed to repeat the control cycle until a predetermined number of articles is taken from the receptacle and to then direct the transport unit with the receptacle device to travel to a loading station.

4,679,150
AUTOMATIC VENDING MACHINE WITH DISCOUNT FUNCTION

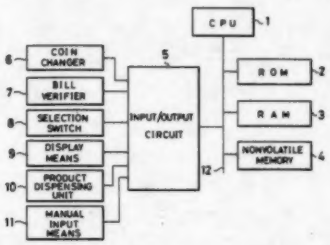
Yukichi Hayashi; Eiji Itako, both of Sakado, and Masahiro Yasuhara, Saitama, all of Japan, assignors to Kabushiki Kaisha Nipponcoinco, Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,040

Claims priority, application Japan, Apr. 17, 1984, 59-75748

Int. Cl.[4] G06F *15/20; G07F 5/02, 5/00*

U.S. Cl. 364—479 **6 Claims**



1. An automatic vending machine with a discount function, said automatic vending machine being provided with continuous sale control means for subtracting a regular sales price from a total amount of money deposited in the automatic vending machine every time a product is sold and for continuously dispensing a selected product so long as an outstanding balance is larger than the regular sales price, comprising:

a first determining means for determining whether or not money is depositied in the vending machine;

a second determining means for determining whether or not the outstanding balance is decreased to zero;

single sale operation memory means responsive to results of determinations effected by said first and second determining means for storing single sale operations until the outstanding balance is decreased to zero;

a third determining means for determining whether or not said single sale operation memory means stores the single sale operations;

means for counting the number of products sold while it is determined by said third determining means that said single sale operation memory means stores single sale operations;

reference number detecting means for determining whether or not a count of said counting means reaches a predetermined reference number and for generating an output when the predetermined reference number has been reached; and

product sales price output means for supplying a price output to said continuous sale control means, said price output being changed from a first output indicative of the regular sales price of a product to a second output indicative of a discount price which is obtained by subtracting a predetermined amount from the regular sales price while

the output is being generated from said reference number detecting means.

4,679,151

CONTROL FOR A LIMITING DEVICE

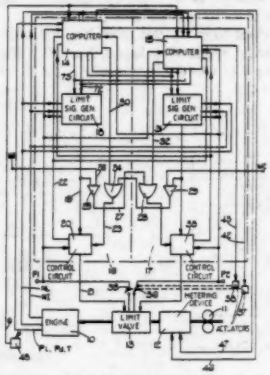
Clive A. Morris, and Michael J. Joby, both of Solihull, England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Jul. 14, 1983, Ser. No. 513,816

Claims priority, application United Kingdom, Jul. 20, 1982, 8220913

Int. Cl.[4] G06G 7/57; G05B 9/02; G06F 7/34; G01F 11/04

U.S. Cl. 364—510 15 Claims



12. A system for generating electrical signals for operating a limit device on an apparatus, said system comprising first and second circuits responsive to an operating condition of said apparatus for simultaneously generating nominally identical first and second output signals respectively when said operating condition exceeds a predetermined value, first and second control devices for providing first and second actuating signals to said limit device, said first and second control devices being responsive to said first and second output signals respectively, first and second means for enabling said second and first devices respectively to provide said actuating signals, said means for enabling said second and first control devices being responsive to said first and second output signals respectively, switch means for selectively rendering said limiting signals responsive to said first or second actuating signals, a first power supply for said first circuit and said first control device, a second power supply for said second circuit and second control device, means responsive to unacceptable magnitudes of said first and second power supplies for generating respective first and second indicating signals, means responsive to said first and second indicating signals for operating each said switch means to render said limit device responsive to said second and first actuating signals respectively, each of said first and second circuits including means responsive to said operating condition and to a presettable signal level, whereby when said level-reducing means is operative said first and second circuits can provide said first and second output signals even when said predetermined values of said operating condition are not exceeded.

4,679,152

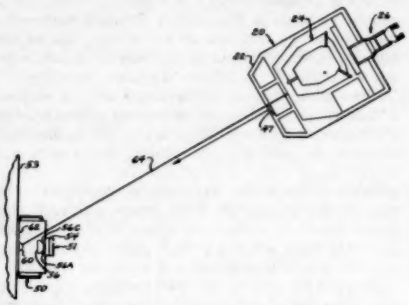
NAVIGATION SYSTEM AND METHOD FOR A MOBILE ROBOT

Terry A. Perdue, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Feb. 20, 1985, Ser. No. 703,354

Int. Cl.[4] G06F 15/50; G05D 1/00

U.S. Cl. 364—513 16 Claims



1. In a mobile robot having a rechargeable storage battery, a method for guiding said robot to a charger positioned adjacent to a wall following detection of a low charge state in said storage battery, said method comprising:

transmitting from the robot a first narrow beam infrared (IR) signal in a 360° scan about the robot;

detecting said first IR signal at the charger and transmitting a second generally omnidirectional IR signal from the charger in response to receipt of said first IR signal thereat;

detecting said second IR signal at the robot and displacing said robot in a generally linear first direction toward the charger until the robot is within a predetermined distance from the charger;

displacing the robot in a generally circular second direction when the robot is within said predetermined distance from the charger, wherein said second direction is initially transverse to said first direction and the charger is positioned at the center of the robot's circular displacement path;

transmitting a third narrow beam IR signal from the robot in the direction of the charger during the circular displacement thereof;

reflecting said third IR signal back to the robot when the robot is positioned directly in front of the charger;

detecting the reflected third IR signal at the robot when the robot is positioned directly in front of the charger;

displacing the robot in a third linear direction generally transverse to said second direction and toward the charger following detection of the reflected third IR signal at the robot to permit the robot to engage the charger for the recharging of its storate battery wherein the steps of transmitting the first and third IR signals includes directing the first and third IR signals through a generally vertically oriented narrow slot in a lateral portion of the robot.

4,679,153

PRINTING SYSTEMS FOR TYPESETTER EMULATION

John S. Robinson, La Grange Park; Thomas E. Ahlswede, Chicago, and Charles A. Cornelius, Evanston, all of Ill., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Apr. 26, 1985, Ser. No. 727,895

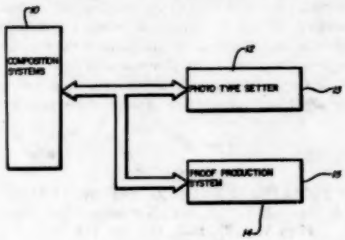
Int. Cl.[4] G03B 15/00; B41B 17/00

U.S. Cl. 364—523 31 Claims

1. A methed of emulating a variety of typesetters to produce an image on a reproduction medium utilizing page data and

font data, wherein at least one of the page data and the font data is encoded in any of a plurality of formats, such data including an identification of the particular format in which the data is encoded, comprising the steps of:

processing the font data and page data in accordance with the identification to derive an encoded representation of



the glyph to be reproduced and to derive character and typesetting commands which together define the placement of the glyph on the reproduction medium; and

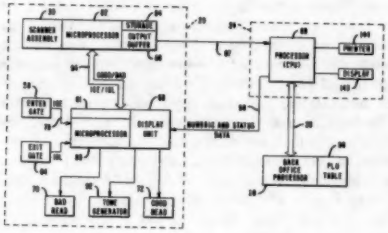
controlling an output device to create the image on the reproduction medium in accordance with the encoded glyph representation and the character and the typesetting commands.

4,679,154

SCANNING CONTROL SYSTEM FOR MERCHANDISE CHECKOUT

Denis M. Blanford, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 9, 1985, Ser. No. 753,076
Int. Cl.[4] G06F *15/24*; G07G *1/00*; G06U *7/10*
U.S. Cl. 364—525 **14 Claims**



1. A checkout system for checking the price of a purchased merchandise item having a coded label located thereon which contains coded indicia representing the identity of the merchandise item comprising;

support means having a transparent portion over which the coded label of the purchased merchandise item is moved;

scanning means mounted within said support means adjacent the transparent portion including a light source operable for projecting scanning light beams through said transparent portion for scanning the coded label, said scanning means generating data signals in response to the scanning of said coded label;

first processing means connected to said scanning means for controlling the operation of said light source, said first processing means outputting the data signals generated by said scanning means in response to the scanning of the coded label by said scanning means;

second processing means connected to said first processing means for receiving the data signal outputted by said first processing means, said second processing means including a table of prices of the merchandise item purchased wherein the second processing means using the data signals received from said first processing means as the address of the merchandise item purchased looks up the price of the item purchased in the table and outputs a first error signal to said first processing means upon not finding the price of the purchased items in the table;

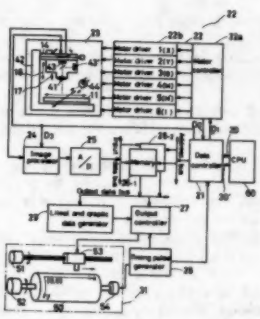
and program means located in said first processing means enabling the said first processing means to disable the operation of said light source in response to the generation of said first error signal.

4,679,155

METHOD AND SYSTEM FOR PROCESSING IMAGE DATA IN REPRODUCING IMAGES

Ikuo Mitsuka, Kusatsu, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jun. 26, 1984, Ser. No. 625,784
Claims priority, application Japan, Aug. 27, 1983, 58-156920
Int. Cl.[4] G09G *1/28*; H04N *1/46*
U.S. Cl. 364—525 **7 Claims**



1. A method of reproducing a plurality of images arranged in a desired layout, said method comprising the steps of:

(i) placing a plurality of originals to be reproduced on a base plate;

(ii) determining reproduction data including scanning start and stop points of each original and a corresponding reproduced image respectively, a desired magnification and a scanning angle relative to each original;

(iii) storing said reproduction data in reproduction data storing means;

(iv) scanning a first track of at least two originals with a predetermined number of scanning lines under control of said reproduction data to obtain first image data of said originals;

(v) storing said first image data in a first memory means;

(vi) scanning a second track of said at least two originals in the same manner as in step (iv) to obtain second image data of said originals;

(vii) storing said second image data in a second memory means while simultaneously retrieving the first image data from the first memory under control of said reproduction data;

(viii) repeating the steps (iv) through (vii) with respect to additional tracks of said at least two originals, alternately changing storing and retrieving functions of the first and second memory means; and

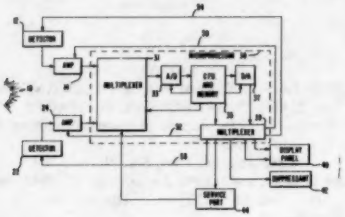
(ix) successively recording the lines of said tracks, whereby the reproduced images are recorded on a photosensitive material in the desired layout.

4,679,156

MICROPROCESSOR-CONTROLLED FIRE SENSOR

Mark T. Kern, Goleta, and Robert J. Cinzori, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Continuation-in-part of Ser. No. 265,764, May 21, 1981. This application Aug. 16, 1984, Ser. No. 641,816
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[4] G08B *17/12, 29/00*
U.S. Cl. 364—551 20 Claims



1. A microprocessor controlled fire sensor system comprising:

a first detector for generating electrical signals in response to incident radiation within a predetermined first spectral band;

a second detector for generating electrical signals from incident radiation within a predetermined second spectral band;

first and second amplifiers respectively connected to the first and second detector for amplifying said signals from the first and second detectors, respectively, to levels compatible with microprocessor inputs;

a microprocessor including a central processing unit with memory (CPU) coupled to receive signals corresponding to the outputs of said amplifiers and process said signals in accordance with a pre-established computer program;

a multiplexer and an A/D converter connected in series between the amplifiers and the CPU to sequentially apply to the CPU digital signals corresponding to analog signals derived from the first and second detectors; and

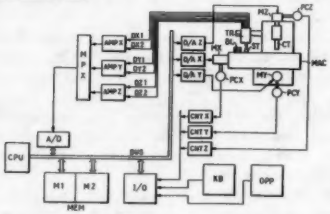
means within the microprocessor for comparing the received signals with at least one preselected threshold stored in the memory, with said means generating an output signal for initiating release of fire suppressant when at least one of the received signals exceeds said one preselected threshold.

4,679,157

TEMPERATURE MEASURING APPARATUS

Masao Hirano, Takatsuki; Motoaki Takaoka, Tsuzuki, and Mikihiko Shimura, Otsu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 13, 1984, Ser. No. 650,061
Claims priority, application Japan, Sep. 14, 1983, 58-170022
Int. Cl.[4] G01K *11/00, 11/12, 11/20*
U.S. Cl. 364—557 9 Claims



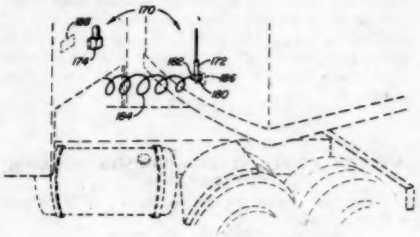
1. A temperature measuring apparatus comprising: a fluorescent substance whose fluorescence characteristics and afterglow characteristics have a known temperature dependence, means for exciting the fluorescent substance, light receiving means for detecting the light emitted by the fluorescent substance when the substance is excited, integration means for integrating signals of received fluorescence and afterglow for a predetermined period of time to provide an output representing an integral amount of light, and means for calculating a temperature of said fluorescent substance by comparing said output representing said integral amount of light with predetermined data representing integral amounts of light emitted by said fluorescent substance when excited at varying temperatures.

4,679,158

AUTOMATIC MIRROR ROTATING SYSTEM

William J. Tate, 132 Filbert Ave., Sausalito, Calif. 94965

Filed Mar. 21, 1985, Ser. No. 714,710
Int. Cl.[4] G02D *5/08*
U.S. Cl. 364—559 14 Claims



1. A mirror positioning system for a towed and a towing vehicle, which comprises a mirror pivotally mounted on a support for movement about a vertical axis, a motor operatively connected to pivot said mirror about the vertical axis, a microprocessor connected to control operation of said motor, a control panel connected to enter user commands and information in said microprocessor, at least one sensor connected to supply input signals to said microprocessor providing information to determine an angle between the towed and towing vehicles, said at least one sensor comprising a retractable cable in a housing, said housing being fixedly attached to the towing vehicle, means for attaching an end of said retractable cable to the towed vehicle and means for generating electrical signals representing a distance the cable end in extended from the housing.

4,679,159

AUTOMATIC ADJUSTMENT METHOD OF TRACER HEAD

Etuo Yamazaki, Hachioji, and Masashi Yamaguchi, Hino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

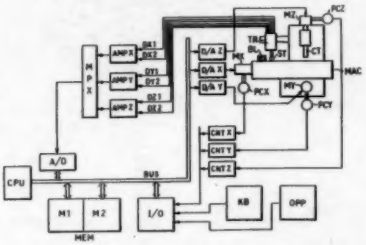
PCT No. PCT/JP84/00430, § 371 Date May 8, 1985, § 102(e) Date May 8, 1985, PCT Pub. No. WO85/01235, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 7, 1984, Ser. No. 734,278
Claims priority, application Japan, Sep. 9, 1983, 58-166370
Int. Cl.[4] G08C *21/00;* G05B *15/46*
U.S. Cl. 364—560 9 Claims

1. An automatic tracer head adjustment method for a tracing control system which is provided with a tracer head, differential transformers mounted in the tracer head, differential amplifier circuits for amplifying the difference between secondary winding outputs of the respective differential transformers to detect the amount of displacement of the tracer head, an analog-to-digital converter for converting the detected displacement signal of the tracer head from analog to digital form, coordinate detecting means for detecting the coordinates of

the tracer head, a processor for processing the amount of displacement of the tracer head converted to a digital quantity and the coordinates of the tracer head, a memory for storing the processed output of the processor and means for D/A converting a digital quantity for control from the processor to control the feed of the tracer head, said method comprising:

a step of storing the output of each differential amplifier circuit as a zero-point offset amount while the tracer head is in a non-contact state;

a step of placing the tracer head in a first contact state, and while doing so, storing a first coordinate of the tracer head and a first amount of detection compensated for by the zero-point offset amount;



a step of placing the tracer head in a second contact state from the first contact state, and while doing so, storing a second coordinate of the tracer head and a second amount of detection compensated for by the zero-point offset;

a step of calculating and storing a gain of each differential amplifier circuit on the basis of the first and second coordinates and the first and second amounts of detection compensated for by the zero-point offset amount; and

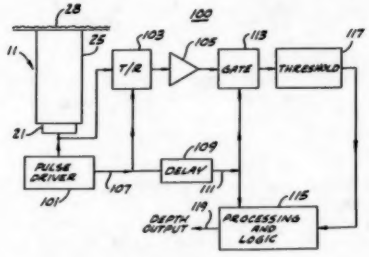
a step of calculating the amount of displacement of the tracer head from an amount of detection obtained by A/D converting a signal from the tracer head through the use of each stored zero-point offset amount and each gain under control of the processor.

4,679,160

ULTRASONIC DEPTH MEASUREMENT APPARATUS AND METHODS

Miles B. Whitener, St. Louis County, Mo., assignor to Surface Systems, Inc., St. Louis, Mo.

Filed Dec. 13, 1984, Ser. No. 681,602
Int. Cl.[4] G01B *17/02*; G01S *15/02*
U.S. Cl. 364—563 **70 Claims**



1. Apparatus for determining the depth of precipitation accumulating on the surface of a pathyway, comprising:

a sensor having an electrical transducer for emitting and sensing ultrasonic energy and having a body of material for propagating the ultrasonic energy therethrough, which body is to be embedded in the pathway with the top surface of the body being substantially flush therewith and exposed to the precipitation, said transducer being physically coupled to the body;

means for supplying electrical pulses to said transducer to cause it to emit pulses of ultrasonic energy, which are reflected as first and second reflections from the top surface of the body and from the upper surface of an accumulation of precipitation on the top surface of the body and are respectively returned to said transducer which in response to the reflected pulses produces corresponding first and second electrical signals;

means connected to said transducer for amplifying the first and second electrical signals corresponding to the first and second reflections, thereby to produce an amplifier output;

means connected to said amplifying means for initiating a first timing signal upon the occurrence of the first electrical signal;

means for comparing the amplifier output with a threshold level which has a magnitude that decreases with time, the operation of said comparing means being started upon an occurrence of the first timing signal, the comparing means initiating a second timing signal when the amplifier output reaches the threshold level; and

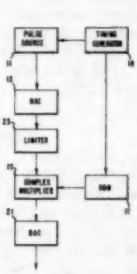
means for generating a third electical signal representing the depth of the precipitation as a function of the time interval between occurrences of the first and second timing signals.

4,679,161

CALIBRATED OVERLAPPING FREQUENCY SWEEP

Rex J. Crookshanks, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 7, 1984, Ser. No. 679,516
Int. Cl.[4] H04B *15/00*
U.S. Cl. 364—571 **8 Claims**



1. A frequency sweep system having an output characterized by a predetermined frequency that is a function of time comprising:

means for providing pulses with a period between pulses;

a first dispersion means for applying a first differential delay which is less tha the period of the providing means;

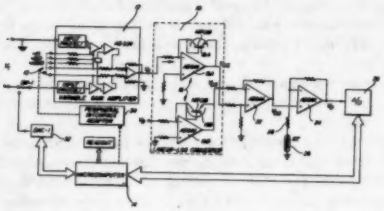
a second dispersion means responsive to the first dispersion means for applying a second differential delay to the pulse; and

a complex multiplier coupled between the first and second dispersion means for simultaneous compensation for distortions introduced by the first and second dispersion means to provide a plurality of overlapping frequency sweeps.

4,679,162
WIDE DYNAMIC RANGE LINEAR TO LOG CONVERTER WITH MICROCOMPUTER CONTROL

Alan C. Ferber, Hillside, and Morteza M. Chamran, deceased, late of Elmhurst, both of Ill. (by Delories M. Chamran, executrix), assignors to Perkin-Elmer Corp., Norwalk, Conn.

Filed Sep. 14, 1984, Ser. No. 651,190
Int. Cl.[4] G06F *7/02*; H03M *1/06*
U.S. Cl. 364—571 **10 Claims**



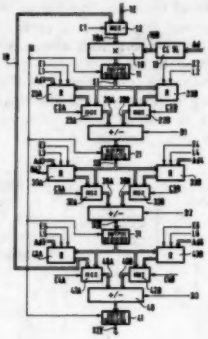
1. A method comprising the steps of:
introducing an analog data input signal into the input of a switchable variable gain instrumentation amplifier;
introducing the output from said switchable variable gain isntrumentation amplifier into the data input of a linear-log converter, the output signal of which being a log function of the input signal;
amplifying said output log signal in such a manner as to correct for the initial offset and for temperature drift;
introducing said corrected log signal to the input of an analog to digital converter to digitize said corrected log signal;
delivering said corrected digitized log signal subsequently to a microcomputer for examining the magnitude of said digitized log signal and for generating a command to switch the gain of said variable gain amplifier, if required, to such a commanded gain value that said digitized log signal magnitude does not exceed a preselected log value; and simultaneously delivering to a readout device a corrected log signal value which corresponds to said digitized log signal magnitude to which is added a value which is substantially the log of said commanded gain value, thus extending the range of said log signal as shown on the readout by the log of said commanded gain.

4,679,163
INVERSE DISCRETE COSINE TRANSFORM CALCULATION PROCESSOR

Emmanuel Arnould, Villarceaux, and Jean-Pierre Dugré, San Clenente, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 8, 1985, Ser. No. 709,857
Claims priority, application France, Mar. 9, 1984, 84 03667
Int. Cl.[4] G06F *15/332*
U.S. Cl. 364—725 **3 Claims**

1. Inverse discrete cosine transform calculation processor for calculating the transform of a sequence of N digital data points also called coefficients where $N=2^n$ and n is an integer greater than two, comprising four successive calculation stages each assigned to a single operation and together constituting a processor module controlled by a programmed store, wherein a first stage, the module input stage, comprises a multiplication unit connected to an associated addressable store holding sine and cosine function values and an input multiplexer selectively connecting an input bus of the module receiving said coefficients or a loopback bus internal to the module to said multiplication unit, said multiplication unit delivering the successive results obtained over a stage output bus, and each of the second, third and fourth stages comprises an addition/subtraction unit having two input buses and a stage output bus, the output bus of said fourth stage constituting the output bus of the module, two addressable storage registers loaded from the output bus of the stage immediately preceding the stage concerned on its input side, and two stage input multiplexers each

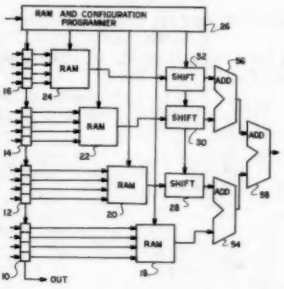


selectively connecting the output bus of said preceding stage or the output bus of one of the registers of the stage concerned to one of the input buses of said addition/subtraction unit of that stage, said loopback bus being connected to the output bus of one of the addressable storage registers of said fourth stage.

4,679,164
DIGITAL HIGH SPEED PROGRAMMABLE CONVOLVER

Thomas C. Rearick, Roswell, Ga., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1984, Ser. No. 682,126
Int. Cl.[4] G06F *15/336, 7/52*
U.S. Cl. 364—728 **4 Claims**



3. A digital high speed programmable convolver module comprising:
a plurality of digital random access memory modules;
each of said random access memory modules having a 320 bit capacity;
a digital register associated with each of said random access memory modules;
programming means;
said programming means providing to each random access memory module all products of a constant factor multiplied by all combinations of N bits;
each of said registers having a capacity of N bits;

said programming means providing to each register N bits of a variable factor;

a shift register associated with each of said random access memory modules except one;

said programming means providing to each of said shift registers directions of the number of spaces its input is to be shifted;

each of said random access memory modules delivering to its associated shift register the product identified by the N bits of its associated register;

an adder associated with each pair of shift registers and the remaining shift register and digital random access memory module; and

an adder associated with each pair of adders.

4,679,165

MULTIPLICATION UNIT AND METHOD FOR THE OPERATION THEREOF

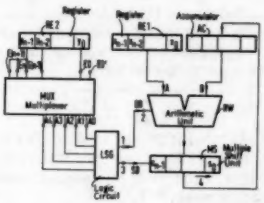
Alois Rainer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berling and Munich, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,585

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335424

Int. Cl.[4] G06F 7/54

U.S. Cl. 364—760 **7 Claims**



1. A multiplication unit for multiplying two n-place binary numbers comprising:

a first register containing the multiplicand;

an accumulator for storing intermediate results;

an arithmetic unit having inputs respectively connected to the outputs of said first register and said accumulator for undertaking interative combinations of the contents of said first register and said accumulator, said arithmetic unit further having an instruction input;

a multiple shift means having an input connected to the output of said arithmetic unit for receiving the result of each combination in said arithmetic unit therefrom, and an output connected to the input of said accumulator, and further having a control input;

a second register containing the multiplier;

a multiplexer having a plurality of inputs respectively connected to the outputs of said second register for receiving the n bits of said multiplier from said second register, and having a selected plurality of outputs, said multiplexer further having a first multiplexer input connected so as to always exhibit a logic "0" and two additional multiplexer inputs connected for always exhibiting the highest order bit for said multiplier, said multiplexer through-connecting a selected plurality of adjacent bits of said multiplier to said selected plurality of outputs; and

a logic circuit having a plurality of inputs respectively connected to said selected plurality of outputs of said multiplexer, said logic circuit generating an instruction signal based on said selected bits of said multiplier which is supplied from said logic circuit to said instruction input of said arithmetic unit for instructing the combination to be undertaken on the inputs of said arithmetic unit, said logic circuit further generating a control signal based on said selected bits of said multiplier which is supplied to said control input of said multiple shift means for controlling transfer of the contents of said multiple shift means to said accumulator.

4,679,166

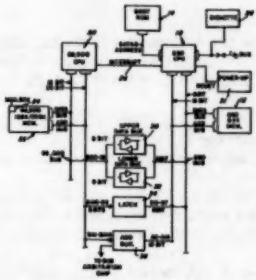
CO-PROCESSOR COMBINATION

Michael F. Berger, Fort Worth, and Sammy D. Sawyer, Arlington, both of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Continuation of Ser. No. 458,541, Jan. 17, 1983, Pat. No. 4,590,556. This application Nov. 12, 1985, Ser. No. 796,760

Int. Cl.[4] G06F 9/00

U.S. Cl. 364—900 **23 Claims**



1. A microprocessor system comprising;

a first processor,

a second processor,

means intercoupling the first and second processors including an address bus and a data bus associated with the first processor and an address bus and a data bus associated with the second processor,

a first memory associated with the first processor and coupled thereto via the first processor address bus and data bus,

a second memory associated with the second processor and coupled thereto via the second processor address bus and data bus,

a third memory associated with the first processor and comprising a read-only memory for storing a boot strap control program,

power-up reset circuit means including means for generating a reset signal and means coupling the reset signal to the first processor causing first processor instruction operation in accordance with the boot strap control program to load the operating system into the first memory,

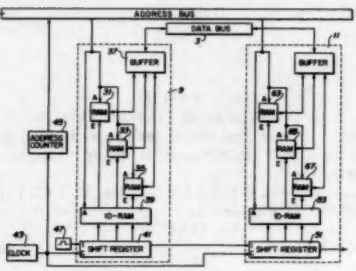
means responsive to said program after loading of the operating system to terminate operation in accordance with the boot strap control program and commence operation in accordance with the operating system, and

control means responsive to a first operating system type code for establishing control of said microprocessor system in said first processor and holding said second processor in an inactive state, and responsive to a second operating system type code for transferring control of said microprocessor system to said second processor.

4,679,167
APPARATUS FOR LOCATING A MEMORY MODULE WITHIN A MEMORY SPACE

James S. Finnell, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 29, 1983, Ser. No. 518,600
Int. Cl.[4] G06F *12/06, 13/00*
U.S. Cl. 364—900 3 Claims



1. An initialization circuit for initializing a memory space having a plurality of RAMs residing on a plurality of RAM cards with n RAMs on each RAM card, the circuit comprising:

a clock;

a pulse generator;

an address counter having an input coupled to the clock and an output;

a plurality of n-cell shift registers, each being resident on a RAM card and each shift register having a data input and a data output and also having a clock input coupled to the clock;

a plurality of ID-RAMs each having a plurality of n-bit wide memory locations, each ID-RAM residing on a RAM card and having an address input coupled to the address counter output and a data input coupled to the shift register of that RAM card for receiving the n-bit contents of that shift register;

wherein the data input of a first of the shift registers is coupled to the pulse generator and the data output of the first shift register is coupled to the data input of a second shift register, each succeeding shift register being connected in series with the others;

wherein each of the n RAMs on each RAM card has an enable input coupled to the associated column within the ID-RAM on that RAM card; and

such that a "1" bit generated by the pulse generator being clocked through the serially connected shift registers causes a plurality of n-bit codes to be stored in the ID-RAMS, thereby enabling only a single RAM within the memory space upon access of a selected ID-RAM memory location.

4,679,168
INTELLIGENT BROAD BAND DIGITAL RF MEMORY

Larry J. Conway, and Paul I. Pulsifer, both of Kanata, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Feb. 5, 1985, Ser. No. 698,438
Claims priority, application Canada, Jul. 30, 1984, 459972
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 9 Claims

1. An intelligent boardband digital RF memory comprising:

input/output delay line means for distributing an input signal;

means coupled to said input/output delay line means for sampling the distributed signal at predetermined points along said delay line means;

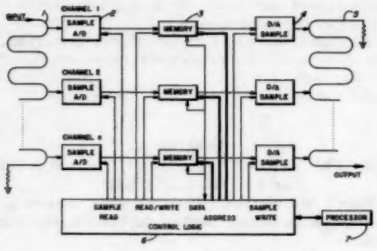
means coupled to said sampling means for A/D converting said samples from analog levels to digital words;

means coupled to said A/D converting means for storing said digital words;

control and processor means coupled to said storing means for accessing, modifying and analyzing said stored digital words;

means coupled to said storing means for D/A converting said digital words to analog levels; and

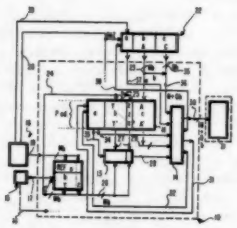
means coupled to said D/A converting means for applying said analog levels to said input/output delay line means at points corresponding to said predetermined points, whereby a reconstructed signal is formed.



4,679,169
PRINTER HAMMER RESETTING CONTROL SYSTEM

Christian de la Salle, Evry, and Guy D'Hervilly, Ris-Orangis, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1984, Ser. No. 587,755
Int. Cl.[4] G06F *3/12*
U.S. Cl. 364—900 4 Claims



1. A microprocessor-controlled printer hammer resetting control system characterized in that it includes:

first storing means which can be loaded from the microprocessor with hammer operation codes including a hammer SET code and an address value of the hammer to be controlled,

said first storing means providing a first status signal when loaded with said hammer SET code and said address value,

binary counting means of the cyclic type for repeatedly counting a predetermined number of timing pulses representing the elapsed time of a hammer operating cycle and which permanently provides a binary count output comprising time information (Y) indicating the instantaneous cycle count of said counting means and mask information (Z) indicating the count cycle of said counting means, said mask information changing in value on every cycle,

second storing means which can be loaded simultaneously with a binary count corresponding with said elasped time of said hammer operating cycle and with said address value loaded into said first storing means,

said binary count being derived from said binary count output of said counting means and comprising said time information and the complement of said mask information of said binary count output,

said second storing means providing a second status signal when loaded with said binary count and said address value,

comparing means connected to said binary counting means and said second storing means for permanently comparing said binary count stored in said second storing means and said binary count output of said counting means,

said comparing means being operative to produce a control signal having a first level when said binary count and said binary count output are different, and a second level when said binary count and said binary count output are identical, and

control and monitoring means connected for receiving: said control signal from said comparing means, said hammer SET code said first status signal and said address value from said first storing means, and said address value and said second status signal from said second storing means,

said control and monitoring means being operable in response to said first status signal from said first storing means and said first level control signal from said comparing means for (1) transmitting said hammer SET code and said address value of said first storing means to said hammer to be controlled, and (2) loading into said second storing means said binary count derived from said counting means and said address value in said first storing means, and then transmitting a hammer RESET code and said address value of said second storing means to said hammer to be controlled in response to said second status signal from said second storing means and said second level signal from said comparing means,

said hammer RESET code being derived by said control and monitoring means from said second level signal of said comparing means.

4,679,170

RESISTOR WITH LOW THERMAL ACTIVATION ENERGY

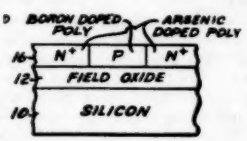
Ronald R. Bourassa, and Douglas B. Butler, both of Colorado Springs, Colo., assignors to Inmos Corporation, Colorado Springs, Colo.

Division of Ser. No. 615,166, May 30, 1984, Pat. No. 4,560,419. This application Nov. 12, 1985, Ser. No. 797,050

The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.

Int. Cl.[4] H01L *27/04;* **G11C** *11/40*

U.S. Cl. 365—154 **15 Claims**



1. A method of using a polysilicon structure as a resistance device in a semiconductor circuit comprising the steps of:

coupling a polysilicon structure in circuit with portions of an integrated circuit, applying a voltage across said polysilicon structure, and obtaining a current through said polysilicon structure proportional to said voltage,

said polysilicon structure comprising a polysilicon region, a selected one of N-type and P-type impurities defining a middle area in said polysilicon region, the other one of said N-type and P-type impurities defining other areas located in said polysilicon region on the sides of said middle area, a PN junction being defined on one side of said middle area and an NP junction being defined at the other side of said middle area, the concentration of impurities in said middle area being greater than 10^{18} per cubic centimeter, said polysilicon structure having been thermally annealed.

4,679,171

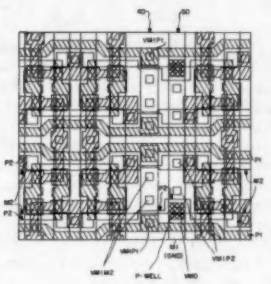
MOS/CMOS MEMORY CELL

Dennis J. Logwood, Palo Alto; Mohammed E. U. Haq, Sunnyvale; John A. Reed, Los Altos, and Joel A. Karp, Atherton, all of Calif., assignors to Visic, Inc., San Jose, Calif.

Filed Feb. 7, 1985, Ser. No. 699,051

Int. Cl.[4] G11C *11/40;* **H01L** *27/04, 29/78*

U.S. Cl. 365—154 **9 Claims**



1. A semiconductor memory array, having a plurality of four-IGFET-transistor memory cells arranged in rows and columns, each said cell having two cross coupled transistors with cross coupled gates and drains, and two access transistors for coupling the drains of said cross coupled transistors to differential bit lines, comprising:

a substrate;

first and second patterned metal layers on said substrate;

first and second patterned poly-silicon layers on said substrate;

for each row, a pair of equipotential poly-silicon word lines and a parallel metal word line which is electrically connected to both of said equipotential poly-silicon word lines at defined intervals along said word line; said parallel word line being formed on said second patterned metal layer; said poly-silicon word lines being formed on said first poly-silicon layer; each of said pair of equipotential poly-silicon word lines forming the gate of one of said two access transistors in each of said cells in the corresponding row of memory cells; and

a grounded poly-silicon plate overlying the capacitive memory nodes of said array; said grounded poly-silicon being formed on said second patterned poly-silicon layer and also providing a ground connection to each of said cells;

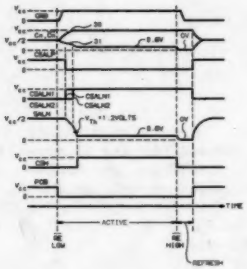
for each column, a pair of differential metal bit lines coupled to said access transistors for the cells in said column, said metal bit lines being formed on said first patterned metal layer after the formation of said poly-silicon plate;

wherein said grounded poly-silicon plate provides alpha particle protection to said array and substantially decouples said capacitive memory nodes from said bit lines.

4,679,172
DYNAMIC MEMORY WITH INCREASED DATA RETENTION TIME

Howard C. Kirsch, Emmaus, and Frank J. Procyk, Center Valley, both of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 28, 1985, Ser. No. 738,664
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—222 **11 Claims**



1. An integrated circuit dynamic memory comprising memory cells arranged in rows and columns, and row decoding means for selecting a row of said cells by applying a voltage to a row conductor; wherein said cells comprise an access transistor having a control electrode connected to a row conductor, a first controlled electrode connected to an information storage capacitor, and a second controlled electrode connected to a column conductor; and further comprising means for latching a column conductor in a low voltage state in response to a voltage level stored in a memory cell,

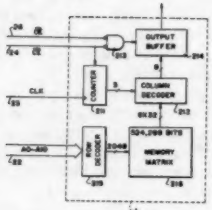
CHARACTERIZED IN THAT:

said integrated circuit further comprises means for maintaining the voltage on a column conductor that is latched in the low voltage state at a level in excess of zero volts for at least a majority of the active portion of a memory cycle, and still further comprises means for reducing the voltage on said column conductor latched in the low voltage state to essentially zero volts during a refresh operation.

4,679,173
SEQUENTIAL ACCESS LSI MEMORY CIRCUIT FOR PATTERN GENERATOR

Kazuyuki Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 12, 1985, Ser. No. 710,687
Claims priority, application Japan, Mar. 13, 1984, 59-47903
Int. Cl.[4] G11C *7/00, 8/00, 11/40*
U.S. Cl. 365—233 **2 Claims**



1. A sequential access LSI memory circuit for a pattern generator, comprising:

a memory matrix for outputting, upon receipt of a row address, row data specified by said row address;

a row address decoder for receiving and decoding an externally-supplied address and supplying the decoded address, as said row address, to said memory matrix;

a counter for sequentially counting from a predetermined value in response to an externally-supplied clock signal, said counter being reset by an externally-supplied chip enable signal;

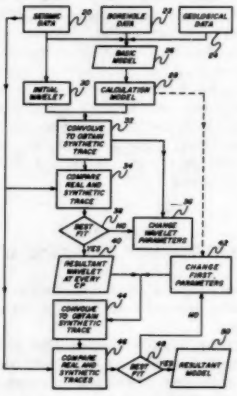
a column address decoder, coupled to said memory matrix and said counter which supplies a count output corresponding to a column address to said column address decoder, for receiving memory output data from said memory matrix corresponding to the row address and for generating column data specified by said column address supplied from said counter; and

an output buffer for receiving the column data from said column address decoder and for outputting the column data in response to an externally-supplied output signal.

4,679,174
METHOD FOR SEISMIC LITHOLOGIC MODELING

Valery A. Gelfand, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Continuation of Ser. No. 604,375, Apr. 26, 1984, abandoned.
This application Feb. 4, 1986, Ser. No. 825,698
Int. Cl.[4] G01V *1/30*
U.S. Cl. 367—73 **8 Claims**



1. A method for optimizing a lithologic model of subsurface earth layers, said lithologic model being derived from a real previously fully migrated seismic section consisting of a plurality of real wavelet-processed, zero-offset seismic traces from a corresponding plurality of seismic stations distributed in a survey area at or near the surface of the earth, comprising:

preparing an initial lithologic model of subsurface earth layers by combining non-seismic data with the lithologic model derived from seismic recordings;

assigning an initial set of layer parameters to said subsurface earth layers;

selecting a plurality of model points among the plurality of seismic stations in the survey area;

establishing a plurality of calculation points between said model points within a zone of interest within said subsurface earth layers,

assigning layer parameters to the subsurface earth layers at each said calculation point by interpolation between adjacent model points;

calculating a reflectivity series at each said seismic station

within said zone of interest by interpolation of layer parameters between calculation points;

generating a synthetic seismic trace from said reflectivity series at each said seismic station to create a synthetic seismic section;

measuring the goodness of fit between said synthetic seismic section and a corresponding real seismic section;

systematically perturbing the layer parameters, at each said calculation point;

generating new synthetic seismic traces after each perturbation to create a new synthetic seismic section and measuring the average goodness of fit between said new synthetic seismic section and said real seismic section;

continuing the perturbative process until the average goodness of fit between said synthetic and real seismic sections is optimized to create an optimal lithologic model; and

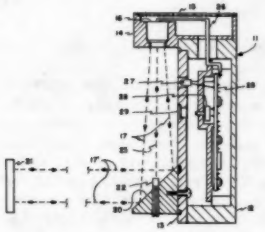
displaying said optimal model.

4,679,175

ULTRASONIC DISTANCE SENSOR WITH DUAL BURST NOISE REJECTION

Kenneth C. Eder, New Brighton, and Robert V. Krzyanowski, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 13, 1984, Ser. No. 681,163
Int. Cl.[4] G01S *9/66, 9/68*
U.S. Cl. 367—98 **13 Claims**



1. An ultrasonic sensor comprising:

transducer means including an electroacoustic transducer for transmitting burst of acoustic energy along a predetermined path in response to electrical drive pulses and converting echoes of the transmitted burst into corresponding electrical signals;

a reference target located in the predetermined path closer to said transducer means than any intended target object for reflecting a portion of the acoustic energy transmitted by said transducer means back toward said transducer means;

transmit circuitry having a control terminal, said transmit signal circuitry being operable in response to a first signal at the control terminal to supply a first electrical drive pulse to said electroacoustic transducer so as to cause it to transmit a first burst of acoustic energy;

receiver circuitry connected to receive electrical signals produced by said electroacoustic transducer, said receiver circuitry being operable to supply a second signal to the control terminal of said transmit circuitry in response to to receipt by said transducer means of an echo from said reference target of the first burst of acoustic energy, thereby causing said transmit circuitry to supply a second electrical driver pulse and said transducer means to transmit a second burst of acoustic energy, said receiver circuitry including a peak detector operable to establish a peak reference level in response to a first echo signal resulting from receipt of an echo of the first burst of acousitic energy from a target object, said receiver circuitry further including comparator means operable to pass a second echo signal resulting from receipt of an echo of the second burst of acoustic energy from the target object if the level of the second echo signal exceeds a predetermined fraction of the peak reference level;

oscillator means for producing periodic clock signals;

counter means operable to accumulate a first count of the clock signals occurring during a time interval commencing at a predetermined time relative to transmission of the second burst of acoustic energy and ending at a predetermined time relative to receipt of the second echo provided that the second echo signal is passed by said comparator means; and

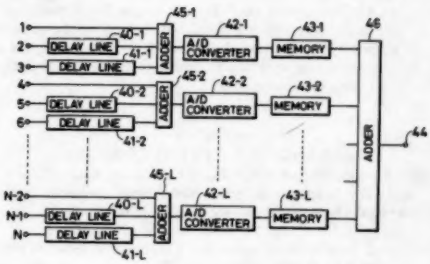
output means connected to said counter means for producing an indication of distance to the target object based on the first count of clock signals.

4,679,176

ULTRASONIC RECEIVING APPARATUS

Toshio Ogawa, Itukaichi; Shinichi Kondo; Shinichiro Umemura, both of Hachiouji, and Kageyoshi Katakura, Meguro, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,945
Claims priority, application Japan, Nov. 24, 1983, 58-219461; Nov. 30, 1983, 58-224198; Jan. 27, 1984, 59-11976
Int. Cl.[4] G01S *3/80*
U.S. Cl. 367—119 **23 Claims**



1. An ultrasonic wave receiving apparatus comprising:

a plurality of transducer elements arranged regularly;

a plurality of sample and hold circuits for sampling and holding signals respectively received by the transducer elements or groups of signals obtained by adding a predetermined number of the signals together; and

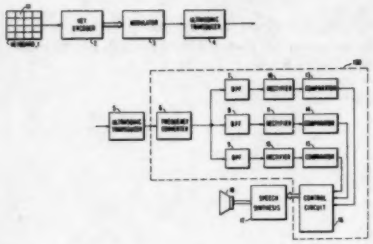
controller means for generating control signals respectively for controlling said sample and hold circuits so as to sample said receiving signals or groups of signals at a time corresponding to the phases of said signals or groups of signals, said controller means including means for comparing a sampling time interval corresponding to a time between the respective phases of receiving signals from the transducer elements adjacent to each other or the groups of signals adjacent to each other with a predetermined value determined in accordance with a settling time of the sample and hold circuits and for generating control signals for enabling sampling of the receiving signals from the transducer elements adjacent to each other or the groups of signals adjacent to each other at the same time when the smapling time interval is less than the predetermined value.

4,679,177

UNDERWATER COMMUNICATION SYSTEM

Masaru Aoyagi, and Makoto Saitoh, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 20, 1986, Ser. No. 831,204
Claims priority, application Japan, Feb. 20, 1985, 60-30627
Int. Cl.[4] H04B 11/00
U.S. Cl. 367—132 1 Claim



1. An underwater communication system comprising:

a transmitter including message inputting means having keys each being assigned to each word, code converting means for converting a key input entered through said inputting means to a code assigned to the key input, modulator means responsive to the code, for performing modulation, and transmit transducer means for converting an output of said modulator means to an acoustic wave, and

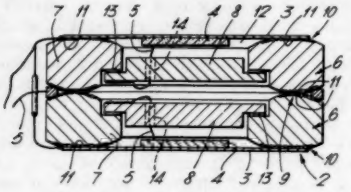
a receiver including receive transducer means for reconverting the incoming acoustic wave from said transmitter to an electric signal, demodulator means for demodulating the code from the electric signal, speech synthesis means responsive to the demodulated code for producing a word corresponding to the code, and speaker means for outputting the synthesized speech.

4,679,178

ARRANGEMENT IN HYDROPHONE

Eigil Larsen, Horten; Eldar Lien, Kjolsdalen, both of Norway, and Clive Snook, Oegstgeest, Netherlands, assignors to Geophysical Company of Norway A.S., Hovik, Norway

Filed Sep. 19, 1985, Ser. No. 777,673
Claims priority, application Norway, Sep. 19, 1984, 843743
Int. Cl.[4] H04R 17/00; H01L 41/04, 41/08, 41/18
U.S. Cl. 367—157 7 Claims



1. An arrangement in a piezoelectric hydrophone having a protective outer housing, in which a water-proof casing is provided comprising two mutually opposed and parallel diaphragm wafers on inner surfaces on which piezoelectric crystals with poles are secured and are coated on their outer surfaces, and where connecting wires extend from the casing through a hollow central portion, and wherein

(a) the central portion of the casing comprises at least two joined ceramic elements, extending in a plane parallel with the diaphragm wafers and being provided with a metalization in areas of mutual contact,

(b) in the cavity of the two joined ceramic elements respectively, a stiffening ceramic plate is inserted and secured to said two joined ceramic elements by matching projections, and

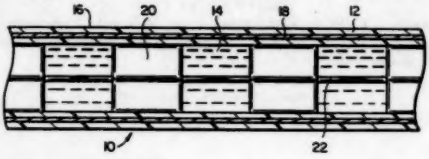
(c) the poles of the piezoelectric crystals facing inward are conductively connected to the metalization in the connecting plane of the two joined ceramic elements with an additional conductive connection from the metalization externally, whereas the poles of the piezoelectric crystals facing outward are joined outside the casing via said diaphragm wafers.

4,679,179

SONAR DETECTION APPARATUS

Thomas P. Lally, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 388,763, Jun. 15, 1982, abandoned.
This application Mar. 29, 1985, Ser. No. 717,489
Int. Cl.[4] H04R 1/28, 1/44; C08L 75/08, 9/02
U.S. Cl. 367—162 9 Claims



1. Sonar detection apparatus suitable for towing behin a ship and comprising:

(1) a longitudinally reinforced tube composed of a radiation cross-linked polymeric composition which comprises

(a) 40 to 70 percent by weight, based on the total polymer, of a radiation cross-linked elastomer having a glass transition temperature of −40° C. to +15° C.; and

(b) 60 to 30 percent by weight, based on the total polymer, of a segmented urethane block polymer

and which has a damping coefficient of at least 0.1 at at least one frequency in the range from 1 Hz to 100 Hz at at least one temperature, in the range from 0° C. to 25° C.;

(2) a plurality of hydrophones within said tube; and

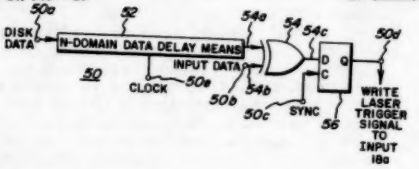
(3) an acoustic coupling fluid between the tube and the hydrophones.

4,679,180

PROCESS FOR DIRECT OVER-WRITING OF DIGITAL DATA RECORDED ON MAGNETO-OPTICAL RECORDING MEDIA

Mark H. Kryder, Allegheny, and Han-Ping D. Shieh, Pittsburgh, both of Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 7, 1986, Ser. No. 837,130
Int. Cl.[4] G11B 5/024, 5/09, 11/00
U.S. Cl. 369—13 17 Claims



1. A method for writing each of a new sequence of digital data bit values over a binary data bit value presently stored in an associated region of a sequence of storage regions in a magneto-optic melting temperature and a compensation temperature greater than ambient temperature, comprising the steps of:

(a) receiving a next data bit value of the new sequence;

(b) reading the value of the data bit presently stored in that region which is associated with the storage of the data bit received in step (a);

(c) comparing the binary values of the new data bit received in step (a) and the present data bit read in step (b) to generate an over-write enable signal if the data bit values are not the same;

(d) proceeding directly to step (f) if the enable signal is not generated in comparison step (c);

(e) inverting the data bit value in the associated storage region by temporarily heating that associated storage region to a temperature greater than the compensation temperature and less than the melting temperature of the magneto-optic medium used, in the absence of any substantial externally-provided bias magnetic field, if the over-write enable signal is generated in comparison step (c); and

(f) then repeating steps (a) through (e) for a next-subsequent data bit, if any, of the new sequence.

4,679,181

METHOD FOR DETECTING AN ERROR IN LOADING A RECORDING DISC

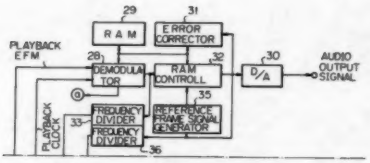
Ryuichi Naito, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 542,189, Oct. 14, 1983, Pat. No. 4,611,319. This application Sep. 8, 1986, Ser. No. 904,614

Claims priority, application Japan, Oct. 15, 1982, 57-180633; 57-180634; 57-180635; 57-180636

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **2 Claims**



1. A method for detecting an error in loading a recording disc on which an information carrying signal including a synchronizing signal is recorded, in an optical information reading system having a focus servo system operative to focus a read light beam on an information bearing layer of said recording disc and a playback system for playing back said information, including a pickup for receiving a reflection of said read light beam from said recording disc and producing a read signal, comprising:

a first step for generating a start signal of a lead-in operation of said focus servo system;

a second step for detecting whether said information carrying signal is present in said read signal at a time a predetermined time period after said generation of said start signal of said lead-in operation;

a third step for detecting whether said synchronizing signal is present in said information carrying signal retrieved from said read signal when the presence of said information carrying signal in said read signal is detected at said second step; and

a fourth step for determining an erroneous loading of said record disc when the presence of at least one of said information signal and said synchronizing signal is not detected at one of said second and third steps.

4,679,182

DISC PLAYBACK DEVICE

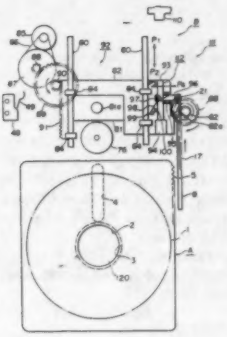
Yasuhiko Kamoshita; Takuya Tamaru; Mikio Ogusu, and Kazuo Urata, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 10, 1985, Ser. No. 774,288

Claims priority, application Japan, Sep. 14, 1984, 59-193525; Sep. 14, 1984, 59-193526; Sep. 14, 1984, 59-139850[U]; Oct. 3, 1984, 59-150096[U]

Int. Cl.[4] G11B *3/36, 17/04*

U.S. Cl. 369—77.2 **14 Claims**



1. A disc playback device comprising:

a loading device for transferring a disc or a case housing a disc between an eject position in which the disc or the disc case is inserted and ejected and a playback position in which the disc can be played, thereby performing loading and eject modes;

a feed device for feeding a pickup head which reads data recorded on the disc in a playback mode in a radial direction of the disc set in the playback position; and

a single drive source for driving both said loading device and said feed device, wherein said drive source drives said feed device which in turn drives said loading device for performing a loading operation during the loading mode, said disc playback device being switched to the playback mode at the end of the loading mode, wherein during the playback mode the drive source drives the feed device but the driving of the loading device is interrupted.

4,679,183

SOUND RECORDING APPARATUS FOR BLANK FILMS AND TAPES

Marcel Staar, Brussels, Belgium, assignor to Staar Development Company S.A., Brussels, Belgium

Filed Aug. 2, 1985, Ser. No. 761,833

Claims priority, application Belgium, Aug. 7, 1984, 900.312

Int. Cl.[4] G11B *11/18*

U.S. Cl. 369—84 **7 Claims**

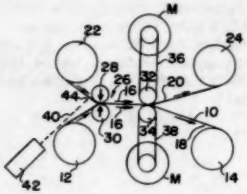
1. An apparatus for reproducing sound recordings on blank films and tapes of plastic materials comprising:

(a) a continuous master film having imprints containing the sound recordings to be reproduced;

(b) reproducing means for transferring the imprints on said master film onto blank film including means for pressing one film against the other and for moving said films continuously and in synchronism past a pressure applying station;

(c) heating means directing heat against the blank film and not the master film for heating to soften only local zones of the blank film which will receive the imprints a fraction

of a second before the imprints in said master film and the local zones of the blank film are pressed together in the



pressure applying station, said local zones being linearly aligned to receive the imprints from said master film.

4,679,184

OPTICAL RECORDING AND REPRODUCING APPARATUS HAVING ERASING BEAM SPOT WITH ASYMMETRICAL INTENSITY DISTRIBUTION

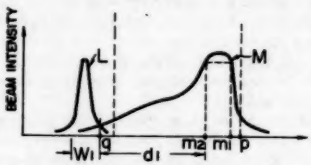
Tomio Yoshida, Katano, and Shunji Ohara, Higashiosaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 31, 1985, Ser. No. 739,872

Claims priority, application Japan, Jun. 8, 1984, 59-118531; Aug. 31, 1984, 59-181782

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—112 **10 Claims**



4. An optical recording and reproducing apparatus having an erasing function, comprising: a light emitting element; a means for transforming light emitted by said element into an erasing beam spot on a recording medium which is scanned by the erasing beam spot, said erasing beam spot being elongated in the direction of relative scan of said recording medium by said erasing beam spot and exhibiting the highest intensity at its leading end portion as viewed in the direction of said scan; and a means for scanning, with a substantially circular beam spot for recording or reproduction, the portion of said recording medium which has been scanned by said erasing beam spot.

4,679,185

PIVOTAL-ARM DEVICE FOR A DISC SCANNING UNIT

Robert N. J. van Sluys, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 19, 1985, Ser. No. 756,537

Claims priority, application Netherlands, Apr. 22, 1985, 8501154

Int. Cl.[4] G11B *3/10, 3/32*

U.S. Cl. 369—255 **8 Claims**

1. A pivotal-arm device for a scanning unit for recording and/or reading information in/from a recording surface of a disc-shaped record carrier, which device comprises

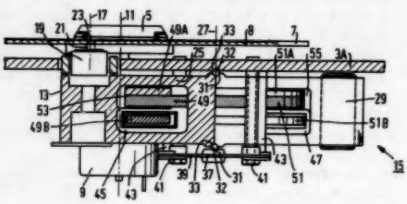
a deck plate,

a pivotal arm comprising means for securing the scanning unit,

pivotal-arm bearing means which pivotally supports the pivotal arm for pivotal movement about a pivotal axis, the pivotal-arm bearing means comprising two bearings, which are disposed on opposite sides of the pivotal arm, and

a resilient element, which is secured to the deck plate, for supporting one of the bearing and for urging the bearings towards one another,

characterized in that at least one of the bearings comprises a spherical bearing element and two facing bearing members which each have a recess to receive a part of the



bearing element, one of the bearing members being disposed on the pivotal arm and at least one of the bearing members having a concave bearing surface having a radius which is larger than that of the spherical bearing element receives therein so that a gap is formed between said concave bearing surface and the bearing element, which gap widens towards the edge of said concave bearing surface and contains a viscous medium.

4,679,186

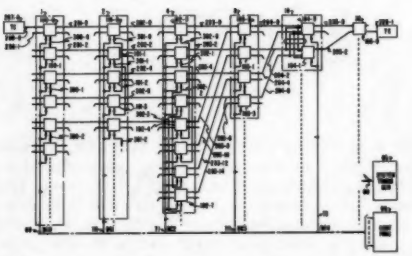
ALTERNATE SELF-ROUTING PACKET SWITCHING NODE HAVING FAULT DETECTION CAPABILITIES

Chin-Tau A. Lea, Lisle, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 26, 1984, Ser. No. 654,764

Int. Cl.[4] H04J *1/16, 3/14*

U.S. Cl. 370—14 **12 Claims**



1. An alternate-path, self-routing, packet and circuit switching system for switching packets and circuit switched information from a plurality of digital data units and for detecting failures within said system, said system comprising:

a switching network having a plurality of stages each comprising interconnected switch nodes;

a plurality of distributed controllers each for interfacingly connecting an individual one of said digital data units to one of said switch nodes;

each of said controllers responsive to a receipt of one of said packets and start of circuit switched information for transmitting address signals to establish a path through said switching network;

each of said switch nodes of one stage being interconnected to a set of switch nodes in the next sequential stage;

each of said switch nodes responsive to receipt of said ad-

dress signals and a multipath signal for setting up said path via any one of a subset of said set of switch nodes in said next sequential stage; and

each of said switch nodes responsive to receipt of said address signals and a unipath signal for setting up said path via a predetermined one of said set of switch nodes in said next sequential stage.

4,679,187

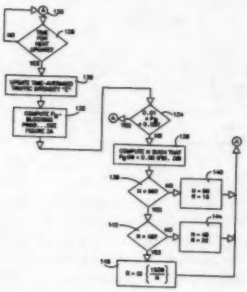
ADAPTIVE TRUNK-COMPRESSION SYSTEM WITH CONSTANT GRADE OF SERVICE

David R. Irvin, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,880

Int. Cl.[4] H04J *1/16*

U.S. Cl. 370—17 **12 Claims**



1. In a telephone switching system having a trunk for carrying messages from a plurality of telephone lines a method for partitioning the trunk into channels so that each telephone line is assured access to a channel comprising the steps of:

(a) determining the message intensity in said trunk;

(b) utilizing said message intensity to compute a blocking probability (P_b) with said P_b indicating the likelihood of a message being blocked within said trunk;

(c) correlating the blocking probability with a desired range of values; and

(d) adjusting the number of channels in said trunk only if the blocking probability falls outside of the desired range.

4,679,188

DIGITAL TRANSMISSION SYSTEM

Misao Fukuda, Tokyo; Toshitaka Tsuda, Yokohama; Kazuo Murano, Tokyo, and Yutaka Awata, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 24, 1985, Ser. No. 779,639

Claims priority, application Japan, Sep. 26, 1984, 59-201021; Dec. 28, 1984, 59-276354; Mar. 28, 1985, 60-064371; May 31, 1985, 60-117860

Int. Cl.[4] H04B *1/56;* **H04J** *3/02;* **H04L** *7/00*

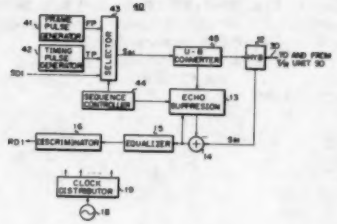
U.S. Cl. 370—29 **31 Claims**

1. A digital transmission system, comprising:

at least two transmitting-receiving (T/R) units:

a single transmission line connected therebetween, the system being operated under a full duplex communication mode; and

at least one of said T/R units comprising a timing control means and a first transmission control means, said timing control means for synchronizing an internal clock of the at least one T/R unit, only during a predetermined period, with a received signal applied to the at least one T/R unit; and said first transmission control means for inhibiting, only during said predetermined period, a transmission of a



send signal from the at least one T/R units to be supplied to the other T/R unit.

4,679,189

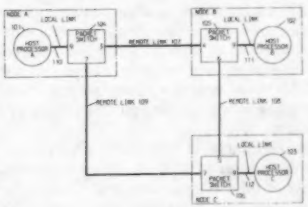
ALTERNATE ROUTING ARRANGEMENT

Jeffrey J. Olson; Stephen R. Peck, and David P. Seaton, all of Boulder, Colo., assignors to American Telephone and Telegraph Company and AT&T Information Systems, Inc., both of Holmdel, N.J.

Filed Nov. 27, 1985, Ser. No. 802,573

Int. Cl.[4] H04Q *11/04;* **H04J** *3/24*

U.S. Cl. 370—60 **29 Claims**



1. A method for providing for the alternate routing of messages transmitted from an originating node to a destination node in a packet switching system having a plurality of nodes wherein each node stores routing information, said method comprising the steps of:

(A) inserting a message to be transmitted into a first field of a multifield frame,

(B) inserting alternate routing control control into a second field of said frame,

(C) transmitting said frame from said originating node over a path towards said destination node via an intermediate node,

(D) using said alternate routing control information in said transmitted frame to access said stored routing information at said intermediate node specifying a plurality of paths available for transmitting said frame from said intermediate node towards said destination node,

(E) selecting one of said specified paths under control of said stored routing information, and

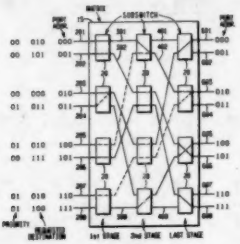
(F) transmitting said message frame from said intermediate node towards a destination node via said selected specified path.

4,679,190

DISTRIBUTED VOICE-DATA SWITCHING ON MULTI-STAGE INTERCONNECTION NETWORKS

Daniel M. Dias, Mahopac; Manoj Kumar, Crompond; Yeong-Chang L. Lien, Briarcliff Manor, and Kiyoshi Maruyama, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,321
Int. Cl.[4] H01Q 11/04
U.S. Cl. 370—60 13 Claims



1. A method of switching packets through a multistage interconnection switching network, comprising the steps of:

(a) assigning a packet, for a circuit connection, the highest assignable priority level only after a corresponding packet, for the circuit connection, with the second highest assignable priority level, was successfully transmitted from a corresponding input of a subswitch of the first stage of the switching network to a corresponding output of a subswitch of the last stage of the switching network;

(b) transmitting each packet at the input of each subswitch of the first stage of the switching network to an output of the same corresponding subswitch, which output is indicated by a respective address bit in the respective packet, a given packet being transmitted as provided for in this step of this claim, only if no other packet, at the same corresponding subswitch, requests the same output of the subswitch;

(c) transmitting the packet with the highest priority level of all the packets at the inputs of each subswitch of the first stage of the switching network to the output of the same corresponding subswitch, which output is indicated by the respective address bit in the respective packet being transmitted, a given packet being transmitted as provided for in this step of this claim only if other packets at the same corresponding subswitch with different priority levels request the same output of the corresponding subswitch;

(d) transmitting, for each subswitch of the first stage of the switching network, any one, of a number of packets transmitted to the inputs of the respective subswitch of the first stage of the switching network, to the output of the respective subswitch indicated by a respective address bit in the one packet, if the number of packets are of the same priority level and request the same output of the respective subswitch; and

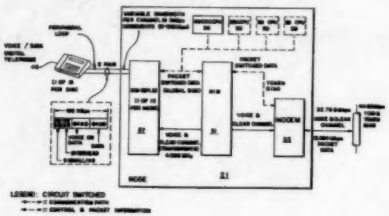
(e) repeating steps b, c, and d for packets at inputs of subswitches of subsequent stages of the switching network until the packets reach respective outputs of subswitches of the last stage of the network, the outputs of the respective subswitches of any of the subsequent stages being requested by respective subsequent address bits in the respective packets so that packets are transmitted from the inputs of the subswitches of the first stage of the multistage interconnection network to the respective outputs of the last stage of the interconnection network.

4,679,191

VARIABLE BANDWIDTH SWITCHING SYSTEM

Gary A. Nelson, Irvine; Patrick N. Godding, Tustin; Richard E. Schumaker, Orange; Keith D. Walter, Huntington Beach; Edward S. Marrone, Los Angeles; Stillman E. Gates, Capistrano Beach; Everett O. Rigsbee, III, San Rafael, and Michael D. Teener, Irvine, all of Calif., assignors to CXC Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 491,551, May 4, 1983, Pat. No. 4,587,651, Ser. No. 582,182, Feb. 21, 1984, and Ser. No. 582,069, Feb. 21, 1984, Pat. No. 4,598,397. This application May 17, 1984, Ser. No. 611,462
Int. Cl.[4] H04J 3/22, 3/16
U.S. Cl. 370—84 25 Claims



1. A digital communications system for transfer of a variable bandwidth of information from within a network signal stream comprised of said information to a digital communication device, said communications system comprising:

at least one network path for carrying the network signal stream, the network path having a first bandwidth;

a plurality of digital communication devices at least one of which has a lower bandwidth than the first bandwidth, a first of said communication devices being operative to generate a message signal for communication to a second of said communication devices;

at least one first controller operative to interpret the message signal and to generate bandwidth allocation control signals defining portions of the first bandwidth which are to be allocated to a communications path between the first and second digital communication devices; and

plural nodes connected to the network path and each connected to at least one of the digital communication devices, the nodes being responsive to the allocation control signals for selectively transferring a variable bandwidth of information between the network path and at least one digital communication device, at least one of said plural nodes comprising:

means for transferring information between said network path and a plurality of network highways;

means for selectively transferring information between said network highways and a plurality of node highways, said node highways having a lower bandwidth than said first bandwidth of said network path; and

means for selectively transferring information between said node highways and a digital communication device connected to said node.

4,679,192

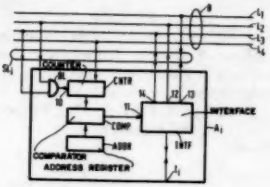
ARRANGEMENT FOR TRANSMITTING DIGITAL DATA

Jean-Pierre C. R. Vanbrabant, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1986, Ser. No. 821,938
Claims priority, application Netherlands, Feb. 19, 1985, 8500462
Int. Cl.[4] H04J 3/02, 3/16
U.S. Cl. 370—85 4 Claims

1. An arrangement for transmitting digital data, comprising a plurality of stations which together with a main station are

connected to a common communication path, these stations comprising a data transmitter, a data receiver and addressing means, characterized in that said main station comprises a disableable clock pulse generator, that said addressing means of each station comprise a clock pulse counter for counting the clock pulses transmitted by said clock pulse generator via a clock channel which forms part of said communication path, that said addressing means further comprise an address register and a comparator arrangement for comparing the instantaneous counting position of said clock pulse counter with the



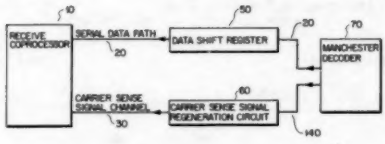
content of said address register, that when there is equality between said counting position and said content and a communication request is present at an addressed station a switching signal is generated by the addressed station which signal disables said clock pulse generator via a SEND-channel forming part of said communication path, that said addressed station transmits digital data via a data channel forming part of said communication path to a second addressed station and that after the data transmission has ended the disabling of said clock pulse generator is cancelled via said SEND-channel which forms part of said communication path.

4,679,193

RUNT PACKET FILTER

Gordon A. Jensen; Stephen P. Reames; Jerry D. Morris, all of Colorado Springs, and Scott S. Neal, Woodland Park, all of Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1985, Ser. No. 798,204
Int. Cl.[4] H04J *3/24, 3/06;* H04B *3/36*
U.S. Cl. 370—94 **5 Claims**



1. A circuit for preventing local area network packets shorter than n bits from being received by a local area network coprocessor, said circuit comprising:

a local area network coprocessor having a serial data input port for receiving serial input data along a serial data path from a local area network decoder, and having a carrier-sense-signal input port for receiving a carrier-sense-signal generated by said local area network decoder, said carrier-sense-signal serving to alert said coprocessor that serial input data is present on said serial data path;

an n bit data-shift register for intercepting said serial-input-data from said decoder, said register implementing an n clock cycle delay in said serial input data's progress toward said serial data input port; and

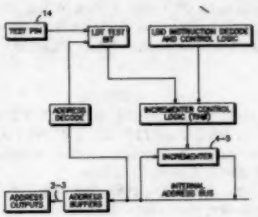
a carrier-sense-signal-regeneration means for intercepting said carrier-sense-signal from said decoder and for modifying said carrier-sense-signal.

4,679,194

LOAD DOUBLE TEST INSTRUCTION

Tulley M. Peters, Round Rock, and William C. Bruce, Jr., Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1984, Ser. No. 656,564
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—16 **10 Claims**



1. In a data processor comprising instruction execution means for reading first and second operands from respective first and second consecutive locations within a predetermined address space in response to executing a single selected instruction, the improvement comprising:

first means for establishing a control condition and for providing an execution control signal indicative of the state of said control condition; and

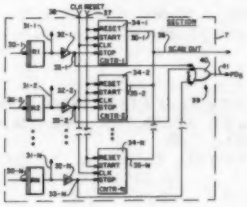
second means, coupled to the instruction execution means and to the first means and responsive to the execution control signal, for forcing the instruction execution means of the data processor to twice read the first operand from the first location in response to executing said single selected instruction.

4,679,195

ERROR TRACKING APPARATUS IN A DATA PROCESSING SYSTEM

Loren G. Dewey, Sunnyvale, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Apr. 10, 1985, Ser. No. 721,564
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—29 **12 Claims**



1. In a data processing system, including a plurality of data locations, through which data are propagated in system clock cycles in response to a system clock signal, an error tracking apparatus comprising:

a plurality of error detection means, each in communication with an associated data location, for detecting errors in the associated location and for generating an error signal upon detection of an error;

a plurality of counter means, each in communication with an associated error detection means and responsive to the system clock signal, for counting system clock cycles and storing a system cycle count for the data location associated with the respective error detection means, each of

said counter means including means, responsive to an error signal from the associated error detection means, for disabling the counter means to freeze the system cycle count indicating the system clock cycle during which the error signal was generated;

interrupt means, responsive to the error signals, for disabling the system clock signal, whereby the system cycle count in each of said plurality of counter means is indicative of the system clock cycle during which the system clock signal was disabled, or during which an error signal was generated at its associated data location.

4,679,196

SEMICONDUCTOR MEMORY DEVICE WITH A BIT ERROR DETECTING FUNCTION

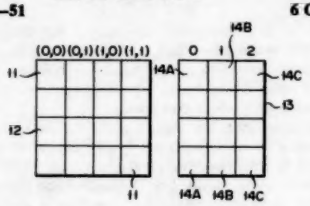
Jun-ichi Tsujimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 26, 1985, Ser. No. 705,788

Claims priority, application Japan, Mar. 1, 1984, 59-39507

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—51 **6 Claims**



1. A semiconductor memory device with a bit error detecting function comprising:

a data memory circuit including a plurality of data cells which are arrayed in rows and columns in a matrix fashion, said plurality of data cells respectively having row and column addresses each expressed by a plurality of bits;

a first parity memory circuit including a plurality of rows of parity storage cells, each row of parity storage cells correspoonding to a different one of the rows of data cells, for storing parity bits which correspond to the parity of data stored in the corresponding row of data cells, said stored parity bits each being specified by the parity of a unique combination of data cells, in that selected bits of the column addresses of each of the data cells in each combination are at a predetermined logical level.

4,679,197

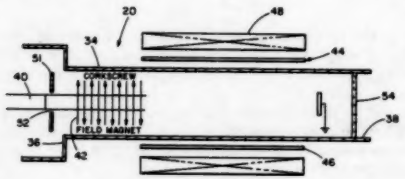
GYRO FREE ELECTRON LASER

Jang-Yu Hsu, Solana Beach, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Mar. 13, 1985, Ser. No. 711,237

Int. Cl.[4] H01S *3/00*

U.S. Cl. 372—2 **6 Claims**



1. A source of coherent radiation in the infrared, visible light and ultraviolet frequency range comprising:

an evacuated drift tube having an input end for receiving a beam of relativistic electrons and an output end for providing coherent radiation;

electron supply means for providing a beam of relativistic electrons to the drift tube input end;

magnetic field means for causing said relativistic electrons to spiral;

azimuthal wiggler means for causing the spiraling electrons to undergo accelerations, said magnet field means also controlling the gyroradii of the spiraling electrons acted upon by said wiggler means.

4,679,198

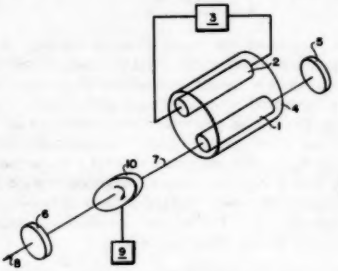
SOLID-STATE TUNABLE LASER

Michael F. Shone, Yorktown Heights, N.Y., and Gabriel M. Loiacono, Franklin Lakes, N.J., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 4, 1986, Ser. No. 848,367

Int. Cl.[4] H01S *3/16*

U.S. Cl. 372—41 **14 Claims**



1. A $Li_4Ge_5O_{12}$ crystal material activated with an amount of a closed shell activator effective to produce emissions in the visible spectrum when excited by ultraviolet or higher energy radiation.

4,679,199

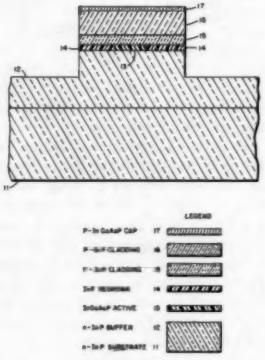
HIGH POWER INGAASP/INP SEMICONDUCTOR LASER WITH LOW-DOPED ACTIVE LAYER AND VERY LOW SERIES RESISTANCE

Robert Olshansky, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 23, 1985, Ser. No. 779,012

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—44 **10 Claims**



1. A high power InGaAsP/InP semiconductor laser with

low-doped active layer and very low series resistance comprising

an n-doped InP substrate;

a buffer layer of n-doped InP deposited on said substrate;

an active layer of InGaAsP deposited on said buffer layer;

a low p-doped cladding layer deposited on said active layer;

a high p-doped cladding layer deposited on said low p-doped cladding layer; and

a p-doped cap layer of InGaAsP deposited on said high p-doped cladding layer.

4,679,200

SEMICONDUCTOR LASER

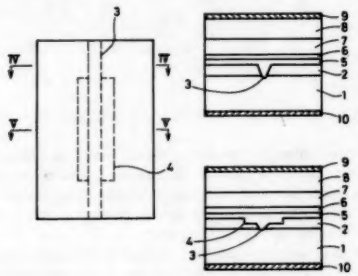
Sadayoshi Matsui, Tenri; Mototaka Taneya, Sakai; Haruhisa Takiguchi, Osaka, and Shinji Kaneiwa, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 16, 1985, Ser. No. 691,917

Claims priority, application Japan, Jan. 17, 1984, 59-6922

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—45 **4 Claims**



1. A semiconductor laser comprising:

a substrate;

a first electrode disposed on one major surface of said substrate;

a current blocking layer disposed on a surface of said substrate opposite said one major surface;

a groove of predetermined width formed transversely in said current blocking layer across an entire length thereof and having a depth extending into said substrate;

an indent formed in said current blocking layer coextensive with said groove at a center portion of said current blocking layer, said indent having a width greater than said predetermined width;

a first cladding layer disposed over said current blocking layer;

an active layer disposed over said first cladding layer;

a second cladding layer disposed over said active layer;

a contact layer disposed over said second cladding layer; and

a second electrode disposed over said contact layer,

said indent forming a gain guide structure, said groove forming an index guide structure,

wherein laser light is emitted in a multiple longitudinal mode to reduce return beam interference noise while exhibiting a stable near-field pattern.

4,679,201

FOLDED CO_2 LASER

Hans Klingel, Teckstr. 91, 7141 Möglingen, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,539

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422525

Int. Cl.[4] H01S *3/03*

U.S. Cl. 372—61 **35 Claims**

1. In a folded longitudinal flow CO_2 laser with an output of at least several hundred Watts, having:

a geometrical longitudinal axis,

a rectilinear tube device of dielectric material containing CO_2, parallel to said longitudinal axis,

said tube device having end zones,

a solid metallic end flange device at each end zone of said tube device,

a flange end portion in each of said end flange devices extending substantially at right angles to said longitudinal axis and having apertures for said end zones of said tube device,

a cavity in each of said end flange devices which communicates with said tube device,

deflecting mirrors accommodated by said cavity,

a gas connecting aperture in each of said end flange devices which communicates via said cavity with said tube device,

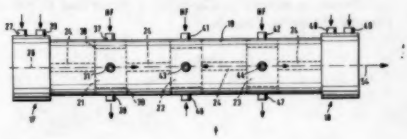
gas-tight sealing devices between said tube device end zones and said flange end portions,

high frequency electrodes extending longitudinally relative to said tube device, and

a mechanical supporting device for said end flange devices;

the improvement in which:

said tube device comprises a plurality of individual tubes between said end flange devices, disposed serially per fold path,



at least one intermediate flange device supports said individual tubes and is aligned with said end flange devices,

said intermediate flange device has a gas connecting aperture,

said intermediate flange device has a cavity aligned with said individual tubes and said gas connecting aperture,

a gas tight sealing device is provided between said intermediate flange device and said individual tubes,

said end flange devices have peripheral zones,

said supporting device is flexurally-resistant and extends parallel to said longitudinal axis and has two end zones which are rigidly fixed in said peripheral zones in a flexurally-resistant fashion and without clearance,

said intermediate flange device is carried by said supporting device in such a manner that said intermediate flange device is moveable lengthwise relative to said supporting device to the extent required by heat expansion, and

said individual tubes are supported in such a manner that said individual tubes are moveable relative to said end flange devices and said intermediate flange device to the extent required by heat expansion.

4,679,202

GAS LASER TUBE APPARATUS

Christopher E. Maloney, 30, High Street, Trumpington, Cambridge, and Russell M. Crane, 29, Izaac Walton Way, Cambridge, both of England

Filed Jun. 21, 1985, Ser. No. 747,242

Claims priority, application United Kingdom, Jul. 3, 1984, 8416916

Int. Cl.[4] H01S *3/03, 3/04*

U.S. Cl. 372—65 **13 Claims**

1. Gas laser tube apparatus comprising:

an alumina outer tube;

an anode;

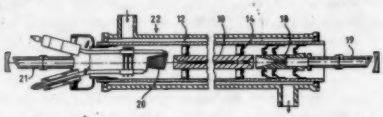
a cathode;

respective supports for the anode and cathode, said supports being brazed to the outer tube to locate the anode and

cathode adjacent opposite ends of the outer tube generally on the axis of said outer tube;

Brewster window stubs carried by the anode and cathode supports;

a beryllia inner tube having a precision ground, continuous, axial bore, and



a plurality of axially spaced copper discs brased to both the outer and inner tubes and locating the inner tube within the continuous bore entered along the anode/cathode axis.

4,679,203

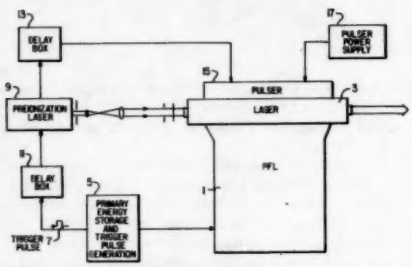
MAGNETICALLY INDUCED PULSER LASER EXCITATION SYSTEM

Roderick S. Taylor, Gloucester, and Kurt E. Leopold, Carp, both of Canada, assignors to Canadian Patents and Development Limited, Ontario, Canada

Filed Jun. 17, 1985, Ser. No. 745,652

Int. Cl.[4] H01S *3/097, 3/223*

U.S. Cl. 372—86 **19 Claims**



1. An apparatus for exciting a laser having first and second electrodes and containing a gas mixture therein, comprising:

preionization means for preionizing the gas mixture,

primary energy storage means for storing a sufficient electrical energy for the operation of the said laser,

energy transfer means connecting the primary energy storage means and the first electrode in an impedance matching manner for transferring the said sufficient electrical energy therebetween in the form of a main discharge voltage pulse,

trigger pulse generating means forming a part of the said primary energy storage means and for generating a trigger pulse in response to the said main discharge voltage pulse,

secondary energy storage means for storing an electrical energy,

electromagnetic energy transfer means connected between the secondary energy storage means and the second electrode for transferring electromagnetically the electrical energy therebetween in the form of a high voltage pulse which breaks down the gas mixture,

switching means connected to the electromagnetic energy transfer means for initiating the electromagnetic energy transfer in response to the trigger pulse,

the main discharge voltage pulse being longer in duration than the high voltage pulse, and

the said two pulses being coincidental for a period of time to produce gas breakdown in the laser and to permit the said energy transfer means for transfering the sufficient energy from the primary energy storage means to the laser.

4,679,204

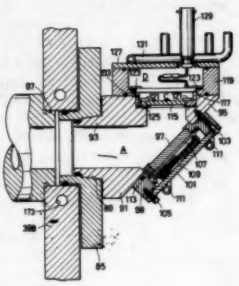
REAR MIRROR HOLDER DEVICE FOR A LASER GENERATOR

Ryoji Koseki, Buena Park, Calif., assignor to Amada Engineering Service Co., Inc., LaMirada, Calif.

Filed Dec. 31, 1985, Ser. No. 814,982

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—107 **8 Claims**



1. A rear mirror holder device for a laser generator comprising:

a support plate, a rear mirror holder supported on said support plate, a mirror mounting member removably mounted to said rear mirror holder and having a first chamber formed therein for the passage of the beam generated by said laser generator;

a support member installed on said mirror mounting member, said support member housing a rear mirror, said rear mirror having a front side and a rear side, the front side of said mirror facing said first chamber, said support member being provided with a first pressure balance orifice formed on one end section of said support member, and said support member having a second chamber formed on the rear side of said rear mirror whereby said first and second chambers communicate with each other through the first pressure balance orifice.

4,679,205

TILTABLE METALLURGICAL FURNACE VESSEL

Peter Heidenreich, Mülheim; Karl-Heinz Heinen, Siegen; Wolfgang Müller, Siegen, and Heinz Veuhoff, Siegen, all of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 717,161

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412077

Int. Cl.[4] F27D *3/14*

U.S. Cl. 373—84 **27 Claims**

1. In a tiltable metallurgical furnace vessel provided with a completely closed lateral protrusion having an underside with a closable discharge opening, the improvement wherein:

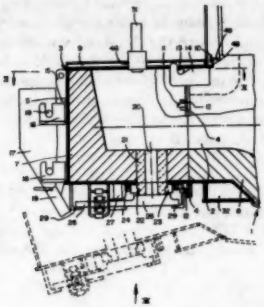
said furnace vessel is provided with a flange;

the protrusion is a removable, heatable fore-hearth which is constricted in the form of a casting spout, said forehearth having a flange and an essentially box shape;

pivoting means is provided for pivotally disposing said forehearth on said furnace vessel; and

fastening means is provided for fastening said flanges of said

fore-hearth and said furnace together, said fastening means including bolts having openings therein and



wedges inserted into said openings, said bolts being affixed to one of said flanges.

4,679,206

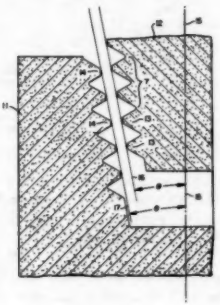
ELECTRODE JOINT THREAD FORM

William H. Burwell, Olmstead Falls, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 734,107, May 15, 1985. This application Jun. 17, 1986, Ser. No. 875,252

Int. Cl.[4] H05B 7/14

U.S. Cl. 373—91 **14 Claims**



1. A method for joining a first carbon or graphite electrode having a tapered threaded projection on at least one end to a second carbon or graphite electrode having a tapered threaded socket in at least one end, the projection and socket comprising a thread crest, thread flanks, and a thread root, the thread flank angles being greater than zero, and the thread crest being essentially parallel to the electrode axis, said method comprising the steps of:

(a) axially aligning said first and second electrodes,

(b) longitudinally advancing at least one of said electrodes toward the other electrode until the thread crest of said first electrode contacts the thread crest of said second electrode,

(c) further longitudinally advancing at least one of said electrodes toward the other electrode until the thread crest of one electrode is in approximate longitudinal alignment with the thread root of the other electrode, and

(d) still further longitudinally advancing at least one of said electrodes toward the other electrode while simultaneously rotating at least one of said electrodes relative to the other electrode about the electrode axis, the rates of said still further advance and rotation being coordinated to be the equivalent of the advancement of the electrode threads, until the threaded projection of said first electrode is screwed fully into the threaded socket of said second electrode.

4,679,207

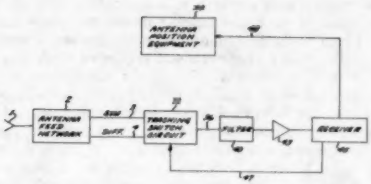
SINGLE CHANNEL TRACKING FOR FREQUENCY HOPPING COMMUNICATION SYSTEMS

George I. Tsuda, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 24, 1985, Ser. No. 758,601

Int. Cl.[4] H04L 27/30; G01S 13/52

U.S. Cl. 375—1 **19 Claims**



1. An antenna tracking system for a frequency-hopping system employing agile synchronization pulses of a certain duration and a system receiver, comprising:

an antenna feed network for providing respective sum and difference signals at respective sum and difference ports; and

an RF switching circuit coupled to said sum and difference ports of said feed network and to the system receiver, said switching circuit for coupling the sum signal to said receiver during a first portion of said synchronization pulse and for coupling said difference signals to said receiver during a subsequent portion of said pulse;

wherein said receiver comprises processing means for providing antenna position error signals in dependence on said sum and difference signals.

4,679,208

EQUALIZATION SYSTEM TUNING DEVICE WHICH UPDATES EQUALIZER COEFFICIENTS BASED ON SELECTED DECISION REGIONS

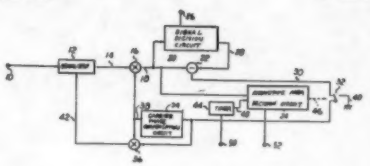
Shigetaka Tanaka, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,116

Claims priority, application Japan, Jul. 31, 1984, 59-158570

Int. Cl.[4] H04B 3/10

U.S. Cl. 375—13 **5 Claims**



1. A tuning device for an equalization system in which a known training pattern is transmitted to facilitate equalization of subsequently transmitted data whenever said data is to be transmitted, comprising:

equalizer means for equalizing a signal received over a signal transmission channel with respect to a characteristic of said signal transmission channel;

first multiplier means supplied with the received signal which has been equalized by said equalizer means;

signal decision means for discriminating a phase of an output

signal of said first multiplier means in relation to the phase of a reference signal;

subtractor means for providing a difference, or error, between the output signal of the first multiplier means and an output signal of the signal decision means which is representative of a discriminated phase, and producing an error signal;

second multiplier means supplied with the error signal from said subtractor means for supplying an output signal of said second multiplier means to the equalizer means;

carrier phase compensation means supplied with the error signal from the subtractor means for applying an output of said carrier phase compensation means to the first and second multiplier means;

insensitive area decision means supplied with the output signal of the first multiplier means for, when the output signal of the first multiplier means lies in a sensitive area defined as a predetermined region of a phase plane in which convergence of equalizer coefficients to desired values is relatively likely to occur, causing the error signal from the subtractor means to be applied to said carrier phase compensation means and the second multiplier means and, when the output signal of the first multiplier means lies in an insensitive area defined as regions of the phase plane outside of the sensitive area where convergence of equalizer coefficients to the desired values is less likely to occur than in the sensitive area, interrupting the supply of the error signal from the subtractor means to the carrier phase compensation means and the second multiplier means thereby disabling operation of the carrier phase compensation means and the second multiplier means, said insensitive area decision means comprising means for producing decision lines which define boundaries of said sensitive and insensitive areas; and

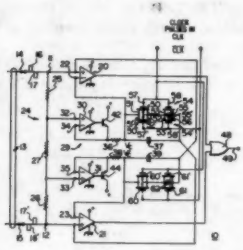
means for varying said decision lines during reception of said training pattern so that the sensitive area is increased.

4,679,209

DIGITAL LINE RECEIVER

John G. Hogeboom, and Terence N. Thomas, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 19, 1985, Ser. No. 756,680
Claims priority, application Canada, Feb. 13, 1985, 474246
Int. Cl.[4] H04L *25/34*; H03K *3/53*
U.S. Cl. 375—17 **11 Claims**



1. A digital line receiver, comprising:

comparator means having a pair of differential inputs including a pair of signal terminals connectable to a source of bipolar signals, and a pair of corresponding reference terminals each cross-coupled to an opposite one of the signal terminals, and an output producing a train of pulses in response to the bipolar signals having a first predetermined voltage;

peak detector means having a pair of input terminals each coupled to a corresponding one of the signal terminals and adapted to receive the bipolar signals at a second predetermined voltage, and a pair of corresponding outputs each producing a threshold voltage in response thereto and coupling the threshold voltage to the corresponding reference terminal of the comparator means; and

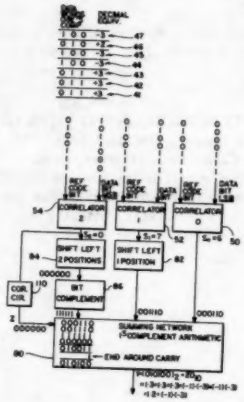
capacitor means connected between each reference terminal and its opposite signal terminal for coupling therebetween the bipolar signals at a third predetermined voltage in serial relation with the threshold voltage and receiving a charge corresponding to the threshold voltage, whereby bipolar signals input to the signal terminals are algebraically summed in the comparator means with the corresponding threshold voltages and the bipolar signals of the third predetermined voltage.

4,679,210

SOFT-LIMITED DIGITAL PULSE COMPRESSOR

Devdas D. Rathi, Los Angeles, Calif., assignor to ITT Gilfillan, a division of ITT Corporation, Van Nuys, Calif.

Filed Jul. 18, 1985, Ser. No. 756,480
Int. Cl.[4] G06F *15/34*
U.S. Cl. 375—96 **15 Claims**



8. Apparatus for generating an output indicating the degree of correlation, in both amplitude and phase, between a reference phase code which comprises a series of binary levels, or bits, and a received data signal which varies in both amplitude and phase, comprising:

means responsive to a received data signal for generating a series of multi-bit data words, each data word representing both the phase and the amplitude of the received signal at a given time, with one bit of each word being a phase bit representing the phase of the signal and the other bit positions of each word being amplitude bits representing the amplitude of the signal;

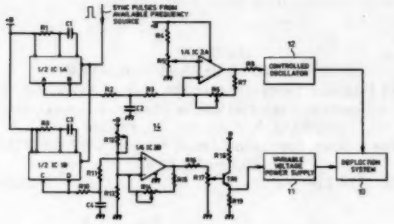
a plurality of amplitude correlator means, each having a first input for receiving a single amplitude bit of predetermined significance of each data word generated by said generating means, and each having a second input for receiving a series of bits of a reference phase code, for generating a digital correlator output number representing the degree of correlation of a series of bits of the same significance in said series of data words with the series of bits of the reference phase code;

means for leftward shifting the output of each amplitude correlator means by a number of places equal to the position of the bit of the data word received by that correlator means, wherein the output of the correlator means that receives the least significant bit is shifted by zero, the output of the correlator means that receives the next to least significant bit is shifted by one, and so forth for any additional amplitude correlator means, to produce a multiplied correlator means output for each correlator means, and means for adding the multiplied correlator means outputs.

4,679,211
REGULATION OF PICTURE SIZE WITH VARYING SCAN FREQUENCY

Walter Kurz, Kitchener, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Jun. 27, 1985, Ser. No. 749,518
Int. Cl.[4] H01J 29/70, 29/76
U.S. Cl. 315—399 12 Claims

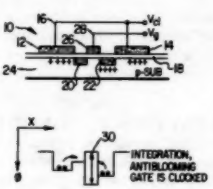


1. In combination with a scanning system for a CRT, said system including a deflection coil and being of either the resonant efficiency magnetic type including a damper diode, a tuning capacitor and switching means or of the linear magnetic (non-resonant) type; a variable output voltage power supply responsive to a control signal for supplying a variable power supply voltage to said scanning system; a frequency responsive control signal generator; and means for supplying a variable frequency signal (i) to said scanning system to produce a scan of variable frequency and (ii) to said frequency responsive control signal generator to produce a control signal which decreases said power supply voltage in response to a decrease in frequency of said variable frequency signal and increases said power supply voltage in response to an increase in frequency of said variable frequency signal, thereby to maintain the magnitude of the peak to peak deflection current in said deflection coil substantially constant.

4,679,212
METHOD AND APPARATUS FOR USING SURFACE TRAP RECOMBINATION IN SOLID STATE IMAGING DEVICES

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1984, Ser. No. 636,425
Int. Cl.[4] G11C 19/28
U.S. Cl. 377—58 9 Claims



1. A charge transfer imaging device having charge removal capabilities comprising:

a semiconductor substrate of one conductivity type having a pair of spaced regions of higher impurity level of said one conductivity type and including means to effect charge transfer along a channel therein,

an insulating layer on said substrate over said channel,

at least two electrodes disposed over said insulating layer, said spaced regions being disposed between said electrodes,

first means coupled to said electrodes for receiving and applying to said electrodes charge transfer clocking pulses,

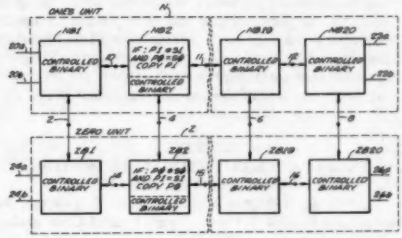
a charge removal gate disposed between said spaced regions and adjacent and spaced from said electrodes, and

second means operable in a first mode to apply pulses of a first amplitude sufficient to remove charge to reduce blooming and operable in a second mode to apply pulses of a higher amplitude than said first amplitude in order to provide imaging exposure control coupled to said charge removal gate for applying pulses to said charge removal gate in order to remove charge through electron-hole recombination through interface traps of electrons and holes.

4,679,213
ASYNCHRONOUS QUEUE SYSTEM

Ivan E. Sutherland, 1035 Devon Rd., Pittsburgh, Pa. 15213

Filed Jan. 8, 1985, Ser. No. 689,635
Int. Cl.[4] H03K 23/58; G11C 19/00
U.S. Cl. 377—66 14 Claims



1. A register for binary digital data comprising:

a first series of binaries for registering one binary digit;

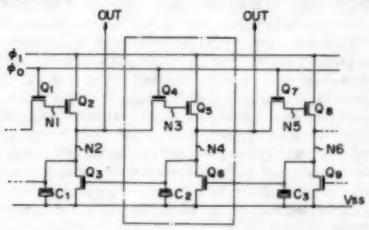
a second series of binaries individually associated with binaries of said first series and for registering another binary digit;

control means intercoupling said first and second series of binaries for causing a binary to assume the state of its predecessor when its predecessor and successor are in different states and the predecessor and successor of its associated binary are in the same state.

4,679,214
SHIFT REGISTER FOR REFRESHING A MIS DYNAMIC MEMORY

Yoshihiro Takemae, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 10, 1984, Ser. No. 648,506
Claims priority, application Japan, Sep. 20, 1983, 58-172096
Int. Cl.[4] G11C 19/28
U.S. Cl. 377—80 9 Claims



1. A shift register having a plurality of circuit stages connected in cascade and receiving first and second clock signals

different in phase from each other for driving the shift register, each of said circuit stages comprising:

a first transistor, having a source and having a drain, one of said source and drain operatively connected to receive an input signal, and having a gate operatively connected to receive the first clock signal, for transferring the input signal in response to the first clock signal;

a second transistor having a gate operatively connected to the other one of said source and drain of said first transistor, having a source and having a drain, one of said source and drain of said second transistor receiving the second clock signal, the other one of said source and drain of said second transistor providing an output signal; and

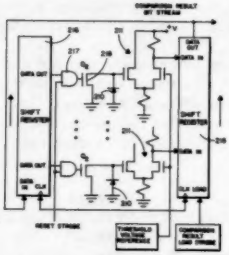
a third transistor having a source, having a drain and having a gate, one of said source and drain of said third transistor being operatively connected to the other one of said source and drain of said second transistor for resetting the output signal, the other one of said source and drain of said third transistor operatively connected to a low level source of potential, said gate of said third transistor operatively connected to receive the output signal from a corresponding second transistor in a succeeding circuit stage and the terminal providing the output signal being connected to the input of said succeeding stage for resetting the input signal input to a corresponding first transistor in the succeeding circuit stage, the output signal of one of the circuit stages providing the input signal to the corresponding first transistor of the succeeding circuit stage.

4,679,215

EXCEEDANCE COUNTING INTEGRATING PHOTO-DIODE ARRAY

Max E. Nielsen, Littleton, Colo.; Joseph H. Labrum, West Jordan, and Patrick S. Grant, Orem, both of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Dec. 6, 1985, Ser. No. 805,930
Int. Cl.[4] G11C *19/00*
U.S. Cl. 377—95 **8 Claims**



1. A charge accumulating measuring system comprising

a plurality of charge accumulating means the output of which are coupled in parallel,

a like plurality of threshold detecting means each coupled to the output of a respective one of said charge accumulating means and constructed to provide a logic level signal representative thereof, wherein each of said logic level signals is at a first logic level when a predetermined amount of charge has not been accumulated by its associated charge accumulating means and is at a second logic level when said predetermined amount of charge has been accumulated by its associated charge accumulating means,

a like plurality of discharge means each coupled to a respective one of said charge accumulating means for selectively discharging the charge accumulated by said charge accumulating means,

output storage means coupled to the output of each of said threshold detecting means for periodically sampling the states of all of said charge accumulating means and for storing all of said logic level signals that are present during said sampling,

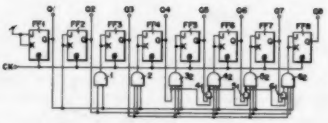
discharge drive means coupled to said storage means and to all of said discharge means for receiving the information stored in said storage means subsequent to its storage therein, said discharge drive means being constructed to periodically selectively discharge only those ones of said charge accumulating means which had accumulated a charge in excess of its associated threshold at the time said charge accumulating means were sampled.

4,679,216

SYNCHRONOUS BINARY COUNTER

Tetsuya Iida, and Takayoshi Ikarashi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 7, 1986, Ser. No. 894,210
Claims priority, application Japan, Aug. 19, 1985, 60-181397
Int. Cl.[4] H03K *23/40*
U.S. Cl. 377—116 **9 Claims**



1. A synchronous binary counter comprising:

a counter including J-K flip-flops constituting lower l bit stages and higher m bit stages, a common clock pulse being fed to a clock terminal of each of said flip-flops;

first logic means for feeding, to J and K input terminals of each of flip-flops among said lower l bit stage flip-flops higher than the second bit stage, an AND of non-inverted outputs of all the lower stage flip-flops than the pertinent stage;

second logic means for feeding, to the J and K input terminals of the first stage flip-flops among said higher m bit stage flip-flops, a first logical product of the non-inverted output of a one bit lower stage flip-flop and non-inverted outputs of the first to (l−1)-th bit stage flip-flops among said lower bit stage flip-flops; and

third logic means for feeding, to the J and K input terminals of flip-flops among said higher m bit stage flip-flops higher than the second stage, a second logical product of non-inverted outputs of the lower first to (l−1)-th bit stage flip-flops and a third logical product, said third logical product being a logical product of an non-inverted output of a flip-flop lower by one bit than each of said flip-flops lower than the second stage and a fourth logical product, and said fourth logical product being a logical product of non-inverted outputs of flip-flops lower by more than two bit stages in said higher bit stage flip-flops.

4,679,217

X-RAY CASSETTE STRUCTURE

Richard A. Fairchild, Stoughton, Mass., assignor to Fairchild Medical Systems, Inc., Stoughton, Mass.

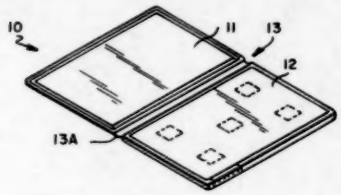
Filed Apr. 8, 1985, Ser. No. 721,070
Int. Cl.[4] G03B *42/04*
U.S. Cl. 378—97 **20 Claims**

1. A cassette structure capable of being positioned behind at least one selected region of an object and used for determining the radiation received by the selected region of said object, said structure comprising

a single housing means including a front and rear cover, radiation which is directed at the selected region of said object being received at said front cover when said structure is positioned behind the selected region;

image producing means positioned within said housing means and responsive to said radiation for producing an image of the selected region of said object;

photovoltaic detection means fixedly positioned, within said housing means in fixed alignment with said image producing means and responsive substantially only to the image



produced by such image producing means for providing an output signal the value of which can be used to determine the radiation received at the selected region of said object.

4,679,218

X-RAY DIAGNOSTIC INSTALLATION HAVING A CONTROL SYSTEM FOR THE X-RAY TUBE HIGH VOLTAGE

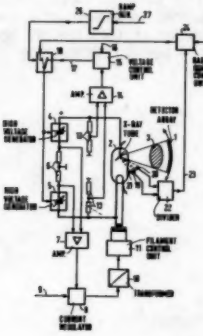
Klaus Brunn, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 24, 1985, Ser. No. 748,235

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3424055

Int. Cl.[4] H05G *1/10*

U.S. Cl. 378—101 **10 Claims**



1. A control system for a variable means for generating high voltage for operating an x-ray tube generating an x-ray field in an x-ray diagnostic installation comprising:

first control means connected to the output of said means for generating high voltage for generating a control signal proportional to the actual voltage output thereof;

second control means including at least two radiation detectors disposed in said x-ray field, a divider connected to the outputs of said radiation detectors for generating a signal proportional to the radiation quality detected, and a radiation quality control unit connected to an output of said divider, said radiation quality control unit having an input for receiving a nominal radiation quality value, and said radiation quality control unit generating a control signal for varying said means for generating high voltage for matching the actual radiation quality detected by said detectors to said nominal radiation quality value;

means for switching connected to each of said first and second control means and to said means for generating high voltage for through-connecting one of said first or second control means to said means for generating high voltage for varying said means for generating high voltage in accordance with the control signal therefrom; and

switch control means for changing the state of said means for switching at a selected time after start-up of said installation.

4,679,219

X-RAY TUBE

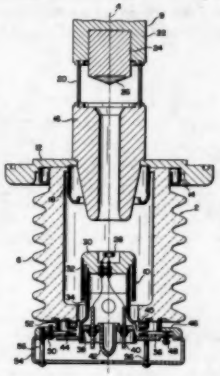
Hidemichi Ozaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 12, 1985, Ser. No. 744,066

Claims priority, application Japan, Jun. 15, 1984, 59-89005[U]; Sep. 29, 1984, 59-147461[U]

Int. Cl.[4] H01J *35/04, 35/10*

U.S. Cl. 378—121 **7 Claims**



1. An X-ray tube comprising:

an evacuated envelope having opposed ends;

a cathode assembly provided at one end of said evacuated envelope and including a uniplanar spiral filament for generating an electron beam with a beam axis, and a pair of terminals for supplying a current to the spiral filament, one of the terminal ends of said spiral filament being located in the proximity of the center thereof;

a pair of supporting leads connected to said terminals, respectively, each of which has a diameter larger than that of the filament, central and peripheral portions of said spiral filament being maintained at a temperature lower than the other portions of said spiral filament by heat dissipation into said supporting leads; and

an anode assembly provided at the other end of said evacuated envelope and facing said cathode assembly, said anode assembly including conical target means, including a tip located substantially along said beam axis, for spherically radiating X-rays.

4,679,220

X-RAY TUBE DEVICE WITH A ROTATABLE ANODE

Katsuhiro Ono, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 17, 1986, Ser. No. 819,822

Claims priority, application Japan, Jan. 23, 1985, 60-10470; Jun. 29, 1985, 60-143773

Int. Cl.[4] H01J *35/10*

U.S. Cl. 378—132 **15 Claims**

1. An X-ray tube device with a rotatable anode comprising:

an evacuated envelope;

at least one cathode which emits electrons, arranged in said evacuated envelope;

a rotatable anode target which radiates X-rays by bombardment of said electrons, arranged facing said cathode;

a magnetic bearing freely and rotatably supporting said anode target;

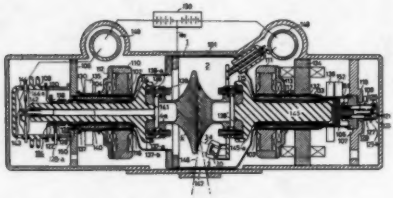
a drive mechanism driving said anode target in rotation; and

voltage means for applying voltage to said anode target through said envelope;

the improvement comprises:

said envelope comprising a chamber portion, from which the X-rays are radiated, and tubular portions extending from both ends of the chamber portion, where the diameter of the chamber is larger than that of the tubular portions; said anode target arranged in said chamber portion;

a first shaft and a second shaft of insulating material fixed on both sides of said anode target, extending to mutually opposite sides in the direction of a tube axis, and arranged within said tubular portions in the neighborhood of the region where they are fixed to said anode target, at least one of said shafts having a conductor



axially provided through said shaft and electrically coupling with the anode target;

a metal tube circumscribing said first shaft and mounted at the periphery of said first shaft, said metal tube comprising a first metal tube mounted to form a gap between it and the circumference of said first shaft, and a second metal tube provided unitary with the circumference of the first tube, constituting a rotor of said magnetic bearing, and said first metal tube comprising an elastic metal tube provided with cut-away portions at its end edges and whose two end edges elastically contact the circumference of said first shaft and a supporting metal tube which supports said rotor by fittin onto its circumference;

a magnetic field generating device containing a stator and arranged on the outside of said tubular portion corresponding to said metal tube for forming said magnetic bearing together with said metal tube; and

said drive mechanism arranged in the neighborhood of said magnetic field generating device and outside of said tubular portion corresponding to said metal tube, and that drives said anode target in rotation by driving said second metal tube by generating a drive magnetic field.

4,679,221

CT X-RAY COLLIMATOR INCLUDING A REINFORCED COLLIMATOR BLADE ASSEMBLY

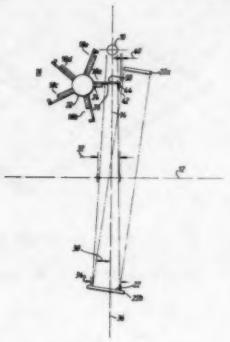
Thomas P. O'Brien, Deerfield, and Richard T. Bernardi, Prospect Heights, both of Ill., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 8, 1985, Ser. No. 763,624
Int. Cl.[4] G21K *1/02, 3/00*
U.S. Cl. 378—148 **12 Claims**

1. A collimator for a computed tomographic X-ray scanner including:

(a) a plurality of generally rectangular blades of X-ray beam stopping material each having a longitudinal slot for passing X-rays from a source to a target, said plurality of blades being mounted in star-shaped configuration lengthwise along a rotatable axle;

(b) motor means for rotating said star-shaped configuration of blades; and



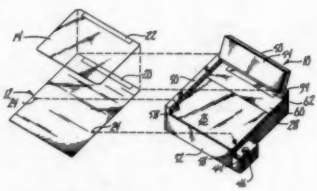
(c) means for minimizing vibration of said blades while maximizing the proximity of said slots to one lengthwise edge of each of said blades, said means comprising an X-ray penetrable reinforcing member affixed to each said blade to extend transversely across at least a portion of each of said slots.

4,679,222

METHOD AND MEANS FOR MARKING X-RAY FILM WITH IDENTIFYING INDICIA

Robert C. Knopp, 1693 Loras Blvd., Dubuque, Iowa 52001

Filed Oct. 21, 1985, Ser. No. 789,390
Int. Cl.[4] G03B *42/02*
U.S. Cl. 378—166 **2 Claims**



1. A method for marking X-ray film with patient identifying indicia comprising:

filling out a patient history form having a patient identification portion and a patient medical history portion, said patient history form being light translucent, said filling out of said patient history form being accomplished by marking light opaque indicia on both said patient identification portion and said medical history portion, said patient identification portion having a predetermined size and shape;

exposing an X-ray portion of said X-ray film to X-rays with an object to be X-rayed placed between the source of said X-rays and said film;

blocking out an identifying area of said film corresponding in size and shape to said predetermined size and shape of said patient identification portion of said history form during said exposure to said X-rays so as to maintain said identifying area of said film in an unexposed condition;

placing a light shield over a window of an exposure box having a light source below said window, said light shield having an opening therein corresponding in size and shape

to said patient identification portion of said medical history form, said shield being made of a material capable of preventing film exposing light rays from passing therethrough;

placing said patient history form over said shield on said window with at least two registration holes in said history form being fitted over two registration posts on said exposure box so as to cause said patient identification portion of said history form to be in registered alignment over said opening of said shield and so as to cause said medical history portion of said history form to be shielded by said shield from light emanating from said light source;

placing said X-ray film over said patient history form in a darkroom environment which protects said film from exposure;

registering said unexposed identifying portion of said film over said patient identification portion of said history form and over said opening of said shield with said exposed X-ray portion of said film being shielded from said light source by said shield;

actuating said light source to cause light to pass through said window, said opening of said shield, and only said patient identification portion of said history form whereby only said identifying area of said film will be exposed and the images of said light opaque indicia on only said identification portion of said history form will be transferred to said identification area of said film;

said filling out of said patient identification portion of said history form with said light opaque indicia being the only transcription of said light opaque indicia in the entire process of transferring the images of said light opaque indicia from said identification portion of said history form to said film.

4,679,223

METHOD FOR DAMPING THE NATURAL OSCILLATIONS OF A PILLAR-STAND CARRYING X-RAY EQUIPMENT, OCCURING WHEN MAKING POSITIONAL ADJUSTMENTS THERETO; AND A PILLAR STAND

Carl-Eric Ohlson, Solna, and Günther Behnke, Skärholmen, both of Sweden, assignors to AO Medical Products AB, Stockholm, Sweden

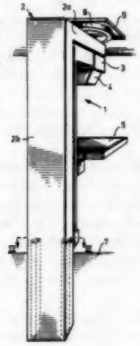
PCT No. PCT/SE84/00278, § 371 Date Apr. 23, 1985, § 102(e) Date Apr. 23, 1985, PCT Pub. No. WO85/01181, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 16, 1984, Ser. No. 726,895

Claims priority, application Sweden, Aug. 25, 1983, 8304617

Int. Cl.[4] H05G *1/02*

U.S. Cl. 378—195 **5 Claims**



1. A movably mounted pillar-stand for carrying X-ray equipment, such as X-ray exposure equipment, a hospital bed, and the like, said pillar-stand comprising:

(a) mounting means for mounting a pillar-stand on a mounting surface for movement relative to the mounting surface;

(b) a supporting stand connected to the mounting means and extending outwardly from the mounting surface for supporting X-ray apparatus adapted for use with equipment for taking X-ray exposures, the supporting stand having a center of mass spaced from the mounting means; and

(c) a mass carried by the pillar-stand at a mass mounting position on the supporting stand, the mass mounting position spaced from the mounting means and from the supporting stand center of mass, the mass having mounting means for mounting the mass on the supporting stand at the mass mounting position for pivotal movement relative to the mass mounting position and having a center of mass spaced from the mass mounting positon, the mass being movable relative to the supporting stand upon natural oscillatory movement of the supporting stand to execute a counter-directional damped pendulating movement in a manner to rapidly extinguish said natural oscillatory movement.

4,679,224

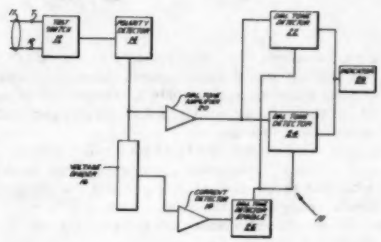
TELEPHONE LINE TESTING CIRCUIT

Daniel Lynch, Jackson, and Steven B. Perry, Highlands, both of N.J., assignors to Keptel, Inc., Ocean, N.J.

Filed Dec. 2, 1985, Ser. No. 803,714

Int. Cl.[4] H04B *3/46*

U.S. Cl. 379—26 **27 Claims**



1. A telephone line testing device for determining whether a fault exists in a telephone line entering a user's premises or in the user's wiring and equipment, comprising:

a. switching means for operably connecting the telephone line to the remainder of the testing device, the switching to make said connection actuating a testing cycle;

b. a plurality of detector elements which receive the telephone line signal from the switching means from which each element detects a characteristic of the telephone line different than the other detector elements; and

c. means for indicating that each detector element has detected that the respective characteristic of the telephone line is in the correct operating range and has the correct operating status during a testing cycle.

4,679,225

SIGNAL TRANSMISSION APPARATUS FOR A MULTIPLE CHANNEL SYSTEM AND METHOD FOR USING THE SAME

Mitsuo Higashiyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 18, 1985, Ser. No. 745,943

Claims priority, application Japan, Jun. 25, 1984, 59-129388

Int. Cl.[4] H04M *11/00, 11/06;* H04Q *7/04*

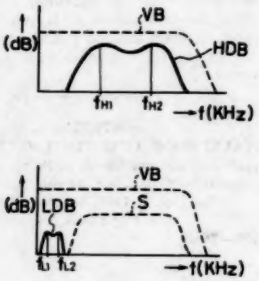
U.S. Cl. 379—62 **16 Claims**

1. In a communications system having a plurality of trans-

mitters for transmitting information signals including audio signals over any one of a plurality of transmission channels, and further having a plurality of receivers for receiving said information signals transmitted over any of said transmission channels, each of said transmission channels having a respective total frequency range including an allocated range for transmitting said audio signals; signal transmission apparatus for establishing a selected transmission channel between a predetermined one of said transmitters and a predetermined one of said receivers, said apparatus comprising:

means at the predetermined transmitter for selecting one of said transmission channels;

means for transmitting at least a control signal indicative of the identity of said predetermined transmitter over the selected transmission channel, said means for transmitting initially transmitting said control signal by using substantially all of the allocated range of said selected transmission channel;



the predetermined receiver including means for establishing the selected transmission channel between it and said predetermined transmitter only in response to the receipt of said transmitted control signal identifying said predetermined transmitter; and

means at said predetermined transmitter for confirming that said selected transmission channel has been established with said predetermined receiver and for generating a confirmation output thereon;

said predetermined transmitter being responsive to said confirmation output for transmitting said audio signals by using a first portion of said allocated range; and

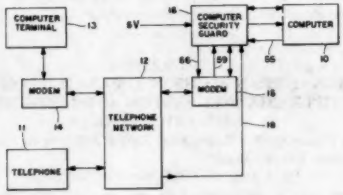
said means for transmitting being responsive to said confirmation output for transmitting said control signal by using a second portion of said allocated range separate from said first portion.

4,679,226

COMPUTER SECURITY GUARD CIRCUIT

Thomas C. Muehleisen, Cuyahoga Falls, Ohio, assignor to Alltel Corporation, Hudson, Ohio

Filed Jun. 17, 1985, Ser. No. 745,782
Int. Cl.[4] H04M *11/00*; H04L *9/00*
U.S. Cl. 379—95 **24 Claims**



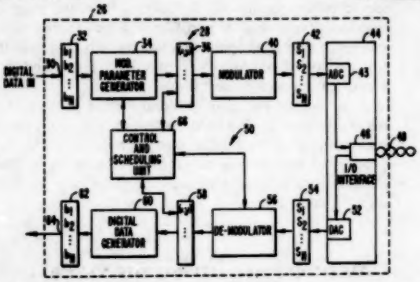
1. A system of communicating with a computer over a communications network comprising a computer terminal, a first modem connecting said computer terminal to the communications network, a second modem, a computer security guard circuit connected between said second modem and the computer, said computer security guard circuit also being directly connected to the communications network to receive a first call through the network and connecting said second modem to the computer upon the receipt thereof, said second modem being connected to the communications network to receive a second call through the network from said first mode, said second call passing from said second modem to said computer security guard circuit, and timing means within said computer security guard circuit to disconnect the second modem from the computer if said second call is not received by said computer security guard circuit within a predetermined time period after the receipt of said first call.

4,679,227

ENSEMBLE MODEM STRUCTURE FOR IMPERFECT TRANSMISSION MEDIA

Dirk Hughes-Hartogs, Morgan Hill, Calif., assignor to Telebit Corporation, Cupertino, Calif.

Filed May 20, 1985, Ser. No. 736,200
Int. Cl.[4] H04M *11/00*; H04B *15/00*; H04L *5/00*
U.S. Cl. 379—98 **17 Claims**



1. In a high speed modem, for transmitting data over a telephone line, of the type that encodes data elements on an ensemble of carrier frequencies, a method for allocating data and power to the carrier frequencies, said method comprising the steps of:

determining the equivalent noise component for every carrier frequency in the ensemble;

determining the marginal power requirement to increase the complexity of the data element on each carrier from n information units to n+1 information units, n being an integer between 0 and N;

ordering the marginal powers of all the carriers in the ensemble in order of increasing power;

assigning available power to the ordered marginal powers in order of increasing power;

determining the value, MP(max) at which point the available power is exhausted; and

allocating power and data to each carrier frequency where the power allocated is equal to the sum of all the marginal powers less than or equal to MP(max) for that carrier and the number of data units allocated is equal to the number of marginal powers for that carrier less than or equal to MP(max).

7. In a high speed modem, for transmitting data in the form of a QAM ensemble of carrier frequencies on a VF telephone line, of the type that measures the magnitude of a system parameter prior to transmission, a method for tracking deviations in the magnitude of the system parameter during the receipt of data, said method comprising the steps of:

generating QAM constellations for a plurality of carrier frequencies;

constructing a demodulation template for one of said plurality of carrier frequencies comprising a plurality of first regions with one of the points of said constellation positioned within each of said first regions;

forming a set of tracking regions where each first region has a first and second tracking region disposed therein;

demodulating said ensemble of carriers to obtain the demodulation points positioned in said set of first and second tracking regions;

counting the number of points disposed in said set of first tracking regions and the number of points disposed in said set of second tracking regions;

determining the difference in the number of counts disposed in said set of first tracking regions and disposed in said tracking regions to construct an error characteristic; and

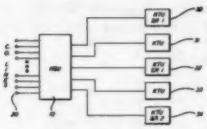
utilizing said error characteristic to adjust the magnitude of said signal parameter during the receipt of data.

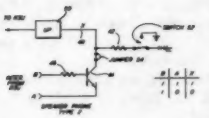
4,679,228

SPEAKERPHONE SENSING CIRCUIT

Vincent V. Korsky, Shelton, and Ronald M. Keenan, Woodbury, both of Conn., assignors to Tie/Communications, Inc., Shelton, Conn.

Filed Mar. 29, 1985, Ser. No. 717,688
Int. Cl.[4] H04M *3/22*
U.S. Cl. 379—165 **6 Claims**





1. Apparatus for enabling a central service unit of a telephone system, the system including a central service unit and a plurality of station sets, to determine whether a station set of the system contains a speakerphone and whether the speakerphone is a first or second type comprising:

first control means having an input line coupled via resistor means to a selected one of a high or low logic level; and

switch means coupled between said input line and a first interrogation line for receiving a first signal from the central service unit and having a control input which receives a second interrogation signal from the central service unit, said second interrogation signal controlling the state of the switch means, the state of the switch means and the selected one of the logic levels to which the input line is coupled indicating to the control means whether the station set includes a speakerphone and the type of speakerphone, said control means including means for transmitting said indication to the central service unit.

4,679,229

RINGING DETECTION CIRCUIT

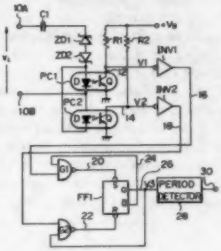
Shingo Yamaguchi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,141
Claims priority, application Japan, Apr. 15, 1985, 60-78440
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—373 **1 Claim**

1. A ringing detection circuit for detecting a ringing having opposite polarities which arrives over a telephone subscriber's line, comprising:

first threshold detector means connected to the subscriber's line for producing an output when detected that the ringing has exceeded a first threshold value in one of the polarities;

second threshold detector means also connected to the subscriber's line for producing an output when detected that the ringing has exceeded a second threshold value in the other polarity; and



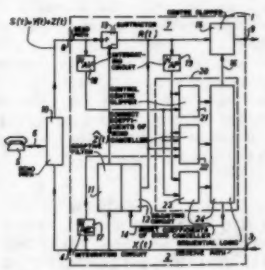
identification means responding to a variation of an output of one of said first and said second threshold detector means and then to a variation of an output of the other threshold detector means, so as to identify reception of the ringing on the basis of a repetition period of one of the variations.

4,679,230

ECHO CANCELLER AND CENTER CLIPPER CONTROL ARRANGEMENT

Jean Lassaux, Lannion, and Christian Dagorn, Perros Guirec, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T, Paris, France

Filed May 7, 1985, Ser. No. 731,640
Claims priority, application France, May 15, 1984, 84 07499
Int. Cl.[4] H04B *3/20*
U.S. Cl. 379—411 **18 Claims**



1. Apparatus for controlling an echo canceller and a centre clipper, in a telephone circuit, comprising:

a. a receive path for transmitting a receive signal having a level N_{REC}; and

b. a send path for transmitting a send signal having a level N_{AV}, in which send path there is an echo signal of the receive signal;

c. the echo canceller including:

i. an adaptive filter, coupled with the receive path, having an output signal, and containing coefficients for approximately the echo signal; and

ii. a subtractor connected in the send path, for subtracting the output signal of the adaptive filter from the send

signal, the subtractor having an output with a level N_{AP} and coupled to a first input of the centre clipper;

iii. an adjusting circuit coupled with the adaptive filter for automatically adjusting the coefficients so that the adaptive filter supplies an approximated echo signal;

d. a control arrangement having first and second outputs at which a centre clipper control signal and an adjusting circuit control signal, respectively, are provided, the control arrangement including:

i. means for comparing:

1. N_{AV} to two fixed levels N_{AV0} and N_{AV1}; and

2. N_{AP}/N_{AV} to a threshold a; and

ii. a decision unit, responsive to the means for comparing, supplying the adjusting circuit control signal at the second output and supplying the centre clipper control signal at the first ouput so that the centre clipper control signal activates the centre clipper according to a clipper threshold, when the means for comparing indicates that N_{AV} is between N_{AV0} and N_{AV1} and when the means for comparing indicates that N_{AP}/N_{AV} is less than a.

4,679,231

TELEPHONE ACCESSORY HOUSING

Hans Reichle, Wetzikon, Switzerland, assignor to Reichle+De Massari AG Elektroingenieure, Wetzikon, Switzerland

Filed Aug. 30, 1985, Ser. No. 771,285

Claims priority, application Switzerland, Sep. 5, 1984, 4230/84

Int. Cl.[4] H04M *1/00*

U.S. Cl. 379—396 **7 Claims**

1. A casing for a telephone accessory for optically displaying a signal representing an incoming call, comprising:

a bottom portion;

a cover portion;

connecting means for detachably fastening said cover portion to said bottom portion so that upon connecting said cover portion and said bottom portion an interior space is defined;

a frame accommodated within said interior space;

optical means connected to said frame for supporting a circuit-carrying print card within said interior space, said cover portion being provided around its periphery with an oblique surface which serves as a viewing window aligned with said optical means.

4,679,232

METHOD AND APPARATUS FOR PROVIDING A GROUND REFERENCE FOR TELEPHONE CUSTOMER SPECIAL CIRCUITS POWERED FROM A FLOATING BATTERY FEED

Kenneth L. Brooks, Naperville; Paul R. Bufkin, Wheaton; David G. Mihal, Oswego, and Jerry G. Miller, Wheaton, all of Ill., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 2, 1985, Ser. No. 761,888

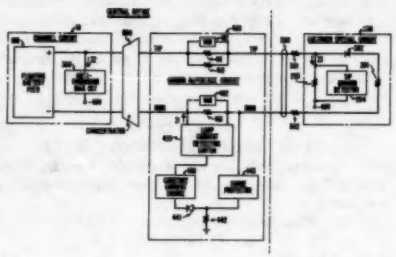
Int. Cl.[4] H04M *9/00*

U.S. Cl. 379—413 **16 Claims**

5. A ground reference circuit for interfacing a floating battery feed via a customer loop comprising tip and ring conductors, to a customer circuit, said ground reference circuit comprising

means for supplying a constant ground current to said ring conductor of said loop, said constant ground current being independent of a voltage on said ring conductor and a portion of said constant ground current being supplied via said loop to said customer circuit and

means responsive to a loop current in said loop for enabling the supplying of said contant ground current from said supplying means to said ring conductor.



wherein said enabling means comprises switch means responsive to said loop current in said loop for coupling said supplying means to said ring conductor.

4,679,233

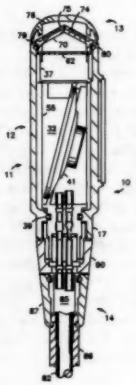
MICROPHONE

Charles P. Richardson, Coral Springs; Virgil Kuhl, Lauderhill; Bernard Gasparaitis, Tamarac; Bruce Staple, Coral Springs, and Larry M. Krieg, Lauderhill, all of Fla., assignors to Motorola, Inc., Schaumburg, Fla.

Filed Aug. 30, 1985, Ser. No. 771,097

Int. Cl.[4] H04B *1/38*; H01Q *1/22, 1/24*

U.S. Cl. 379—433 **15 Claims**



1. A speaker, antenna and microphone assembly comprising,

a housing having a top sound port,

a microphone element mounted within the housing,

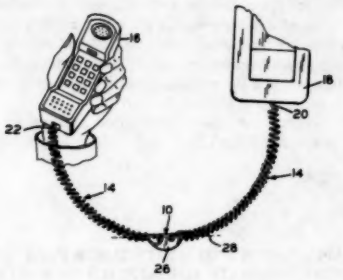
a speaker means mounted within the housing, and

an antenna element mounted within the housing including a surface positioned in front of the speaker to reflect sounds from the speaker toward the top sound port.

4,679,234
TELEPHONE CORD TWIST RESTRAINER

Donald E. Earwood, Sr., 2219 NW. Troost, Roseburg, Oreg. 97470

Filed Apr. 9, 1986, Ser. No. 849,700
Int. Cl.[4] H04M 1/15; H04R 1/06; H01B 7/06
U.S. Cl. 379—438 7 Claims



1. A telephone cord twist restrainer, used in combination with a coiled telephone cord having continuous coils and a longitudinal axis, which cord connects a telephone handset to a telephone base, the telephone cord twist restrainer comprising:

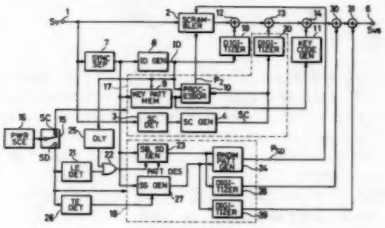
(a) a stabilizing plate, which plate, when inserted in said coiled telephone cord, extends out from said longitudinal axis of said coiled telephone cord beyond the periphery of said continuous coils on a single side only; and

(b) means for attaching said plate to said coiled telephone cord.

4,679,235
TELEVISION SIGNAL TRANSMISSION SYSTEM

Takashi Okada, Kanagawa; Takao Mogi; Hiroyuki Kobayashi, both of Tokyo, and Katsuyuki Ohi, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,291
Claims priority, application Japan, Jul. 7, 1983, 58-123615
Int. Cl.[4] H04N 7/167
U.S. Cl. 380—20 6 Claims



1. Apparatus for scrambling a television signal by inversion thereof, comprising:

means for detecting a change in the scene represented by the television signal and generating a scene change identification signal in response thereto;

means for generating a key code signal having a predetermined pattern;

means for combining said scene change identification signal and said key code signal to produce a first control signal;

means for producing a second control signal, said second control signal having a random pattern including a plurality of periods each having an inversion portion and a non-inversion portion;

means for scrambling the television signal in response to a selected one of said first control signal and said second control signal;

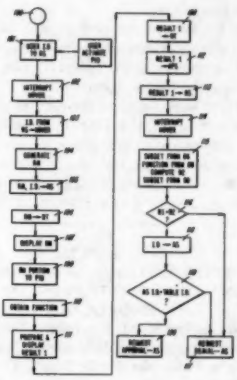
switching means for supplying a selected one of said first control signal and said second control signal to said scrambling means; and

means for generating a starting code signal and a stopping code signal which respectively indicate the start and the end of said second control signal, said starting and stopping code signals being produced in response to said switching means and supplied to said second control signal producing means.

4,679,236
IDENTIFICATION VERIFICATION METHOD AND SYSTEM

Richard E. Davies, 2031 Brooks Dr., Forestville, Md. 20747

Filed Dec. 21, 1984, Ser. No. 684,918
Int. Cl.[4] H04L 9/00; G06K 5/00
U.S. Cl. 380—23 21 Claims



12. In a limited access identification verification apparatus for authorizing access to a secure facility including

a plurality of remote access means and a host processing means having access number generating means, the improvement comprising:

means within each of said remote access means for performing a mathematical function on data input thereto to obtain a first result,

selecting means within said host processing means for selecting for each user a different subset of digits of a random number generated by said generating means, said subset being less than the whole random number, and for selecting and performing a specified mathematical function in accordance with a specified user on the selected digits of said random number to obtain a second result;

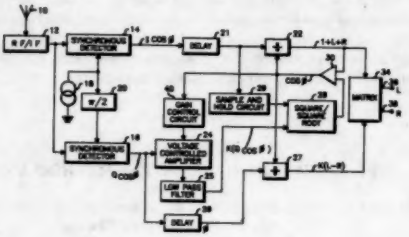
means for receiving said first and second results from said remote access means and from said selecting means; and

means for comparing said received first and second results and for providing a control signal to activate said secure facility only if said first and second results match one another, thereby authorizing access thereto only if a user successfully provides a proper user identification corresponding to a specific remote access means and if the user further selects a proper subset of digits of said random number, corresponding to said user identification, for input to said specific remote access means.

4,679,237
CORRECTION CONTROL CIRCUIT FOR AM STEREOPHONIC RECEIVERS

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 2, 1985, Ser. No. 761,730
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—15 **15 Claims**

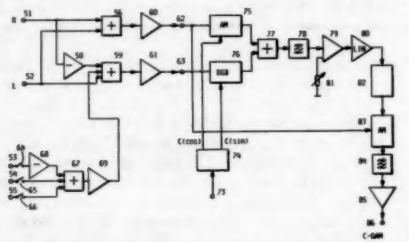


1. Correction control circuit for an AM stereophonic receiver and comprising:
input means for providing first and second input signals which were transmitted in quadrature with each other;
first and second corrector means coupled to correct each of the respective input signals;
a correction signal source coupled to derive a correction signal from at least said input signals and to provide said correction signal to said corrector means; and
means for controlling the amount of second input signal coupled from the input means to the correction signal source in response to the correction signal level.

4,679,238
METHOD AND SYSTEM FOR SIGNALLING ADDITIONAL INFORMATION BY AM MEDIUM WAVE BROADCASTING

A. Markovic, Belgrade; M. Temerinac, Novisad, both of Yugoslavia, and Peter Braegas, Hildesheim, Fed. Rep. of Germany, assignors to Blaupunkt Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Apr. 25, 1985, Ser. No. 727,371
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—16 **23 Claims**

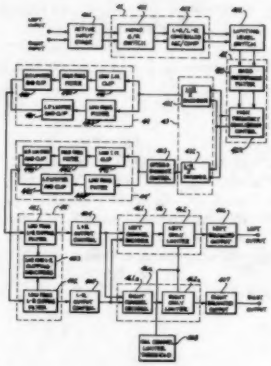


1. Method for signalling information, in an amplitude modulated (AM) medium wave broadcasting system, in addition to audio information, comprising
generating an amplitude modulation medium wave broadcast carrier;
amplitude modulating the carrier with audio signals;
generating a stereo pilot tone having a frequency f_{PT} below the audible range;
generating a first sinusoidal signal having a frequency f_1 according to the formula:
$f_1=(m_1/n)\cdot f_{PT}$;
generating a second sinusoidal signal having a frequency f_2 according to the formula:
$f_2=(m_2/n)\cdot f_{PT}$,
wherein
n is an integer;
m_1 is an integer other than n; and
m_2 is an integer other than n and m_1,
modulating the carrier with said stereo pilot tone in the range of a predetermined permitted modulation index,
modulating the carrier with said first and second sinusoidal signals with amplitudes which, when added, do not essentially exceed the amplitude of the stereo pilot tone which is being modulated on the carrier,
and wherein the phases of the first and second sinusoidal signals are different.

4,679,239
APPARATUS AND METHOD FOR PROCESSING STEREO SIGNALS FOR APPLICATION TO AN AM STEREO BROADCASTING UNIT

Ronald R. Jones, Phoenix, Ariz., assignor to National Communications Research Center, Inc., Tempe, Ariz.

Filed Aug. 22, 1984, Ser. No. 643,071
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—16 **3 Claims**

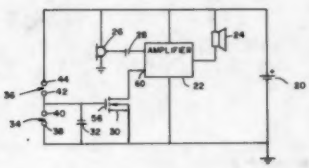


1. In a system for processing signals from an audio source, left channel stereo signals and right channel stereo signals for application to an AM stereo exciter and transmitter unit, signal processing apparatus comprising:
AGC/compressor means coupled to said audio source for gain control;
filter/equalizer means coupled to said AGC/compressor means for passing high freqencies and for boosting bass frequencies;
encoding means coupled to said filter equalizer means for encoding said left and said right channel signals into a left plus right signal and a left minus right signal, said left plus right signal controlling said AGC/compressor means;
means for enhancing said left minus right signal;
means for processing said left plus right signal;
means for processing said left minus right signal;
decoding means for developing a left channel signal, and a right channel signal, for said processed left minus right signal and said left plus right signal; and
limiting means for limiting a negative peak signal of said processed left and said processed right signal.

4,679,240
TOUCH SENSITIVE HEARING AID VOLUME CONTROL CIRCUIT

Jorgen Heide, Cordoba, Tenn., assignor to Richards Medical Company, Memphis, Tenn.

Filed Apr. 15, 1985, Ser. No. 723,579
Int. Cl.[4] H04R 25/02, 25/00; H03G 3/72
U.S. Cl. 381—68.6 25 Claims



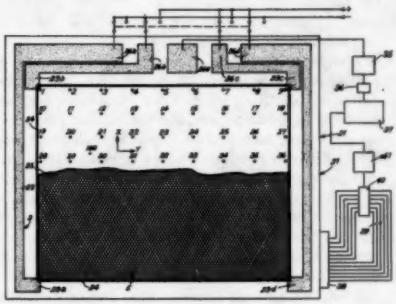
1. A hearing aid, comprising:
a housing;
a sound sensing means located in the housing and having an output signal;
a sound producing means located in the housing and having a signal input;
an amplifier located in the housing and having a gain control input responsive to a change in the impedance connected to the gain control input, a signal input and an amplified signal output, with the sensing means output signal connected to the signal input and the amplified signal output connected to the producing means signal input;
a direct current voltage source located in the housing and having a positive and a negative terminal
a field effect transistor having a gate, a source and a drain located in the body, the source being coupled to one of (a) the negative terminal of the voltage source or (b) the gain control input of the amplifier and the drain being correspondingly coupled to the other of (a) the negative terminal of the voltage source or (b) the gain control input of the amplifier;
a first capacitor located in the housing and connected between the gate and the negative terminal of the voltage source;
a first and a second contact set, each contact set being mounted on the housing and comprising at least two conductive contacts spaced sufficiently close to be bridged by touch, the first contact set being connected between the gate and the negative terminal of the voltage source and the second contact set being connected between the gate and the positive terminal of the voltage source so that when the first contact set is touched the impedance from the drain to the source of the transistor increases and when the second contact set is touched the transistor drain to source impedance decreases.

4,679,241
METHOD AND APPARATUS FOR CORRECTING X-Y POSITION MEASUREMENTS

Lawrence J. Lukis, Prior Lake, Minn., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation-in-part of Ser. No. 419,517, Sep. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 217,130, Dec. 17, 1980, abandoned. This application Mar. 11, 1985, Ser. No. 710,408
Claims priority, application United Kingdom, Mar. 17, 1981, 8108288
Int. Cl.[4] G06K 9/28, 9/18
U.S. Cl. 382—13 4 Claims

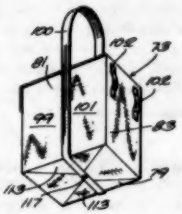
1. The method of generating an electrical signal representative of the actual position of a moveable member comprising, in combination, the steps of
applying an electrical potential across a substantially planar resistive sheet to establish a current flow through said sheet,
measuring the electrical potential induced by said current at each of a plurality of predetermined positions on said surface,
calculating, for each given one of said predetermined positions, a correction factor which relates the potential measured at said given position with the potential to be expected as said given position,
storing each of said calculated correction values in a digital memory,
measuring the magnitude of the potential on said sheet at the position of said moveable member, and
combining said magnitude with at least one of said stored correction values to produce said signal representative of said actual position.



4,679,242
CONVERTIBLE COOLER AND CUSHION

Peter B. Brockhaus, Rte. 1, Owen, Wis. 54460

Filed Oct. 17, 1984, Ser. No. 661,926
Int. Cl.[4] A45C 7/00; B65D 30/20, 81/38; A47J 41/00
U.S. Cl. 383—4 1 Claim



1. A variable volume insulated container for insulating items from ambient temperatures comprising:
a. an insulator fabricated into a back panel, a front panel, two side panels, a bottom panel, and a top flap, the back, front, and side panels defining an opening to the interior of the container, the insulator including at least one sheet of thin flexible material embossed on one side with a multiplicity of indentations, each indentation having an open side and a crown side, and a skin of thin flexible reflecting metallic foil bonded to the embossed sheet on the open side of the indentations to encapsulate the air therein to create a layer of encapsulated air bubbles;
b. a cover of flexible material joined to the exterior faces of the panels and the top flap;
c. an inside flap joined to each side panel adjacent the con-

tainer opening, the inside flap being covered with flexible material on the external face thereof; and

d. means for releasably retaining the inside flaps in contact with the top flap when the top flap is in the closed position,

and wherein the cover and insulator are joined along the longitudinal center line of each side and bottom panel to create a pair of partial panels symmetrical about each respective center line, and the side and bottom panels are foldable outwardly along the respective center lines thereof to thereby render the container fully collapsible into a substantially flat seat,

and wherein the insulator is cut from a blank having the bottom panel interposed between and joined to the back panel and the front panel along respective fold lines between the bottom panel and the back and front panels, the blank back and front panels each being interposed between and joined to a side panel partial panel and having the longitudinal edges thereof coincident with the respective center lines of the side panels, the lower end of each partial side panel being colinear with the fold line between the bottom panel and the respective back and front panels, so that when the seat is unfolded the insulated container thereby produced has full insulation on all interior faces thereof and means forming triangular tabs in the cover material during the unfolding process at the junction of the bottom and side panels, said tabs being devoid of insulation and are thereby flexible for each unfolding of the seat without bunching of insulation in the triangular tabs,

and wherein the cover and insulator are joined along the longitudinal center lines of the bottom and side panels to enhance foldability,

and wherein:

i. an elongated narrow piece of flexible material is joined to the side panels along the longitudinal center lines thereof and is looped over the container opening to create a carrying handle;

ii. the flexible narrow piece of material extends beyond the bottom panel of the container to form a pair of short ends; and

iii. the short ends are provided with fastening means for releasably fastening the short ends to each other,

so that the flexible triangular tabs inherently produced in the cover material during the process of unfolding the collapsed seat to create an insulated container may be folded and held together in place under the bottom panel thereof by the fastening means.

4,679,243

DATA TRANSMISSION USING A TRANSPARENT TONE-IN BAND SYSTEM

Joseph P. McGeehan, Corsham, and Andrew Bateman, Bath, both of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 617,733, Jun. 6, 1984. This application Aug. 12, 1985, Ser. No. 764,984

Claims priority, application United Kingdom, Aug. 17, 1984, 8421025

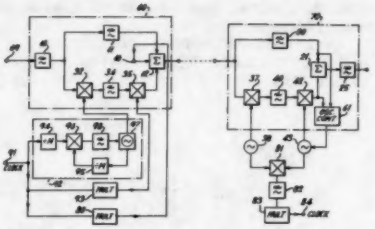
Int. Cl.[4] H04B *1/68*

U.S. Cl. 455—47 **20 Claims**

17. A communication system comprising:

a transmitter including: (a) means for causing a band of frequencies to carry information, means for dividing said band into upper and lower portions with a frequency notch portion between said upper and lower portions by frequency translating at least part of said band which corresponds to one of said portions, and (b) control means, responsive to a control input signal to vary the width of the notch portion, and

a receiver comprising a receiver processor for recovering said information, said receiver processor including means



for providing an output signal representative of the width of the notch portion.

4,679,244

METHOD OF TRANSMITTING TERMINATING CALL SIGNALS WITHIN A RESTRICTED DURATION AND A BASE STATION AND A PORTABLE UNIT FOR USE IN THE SAME

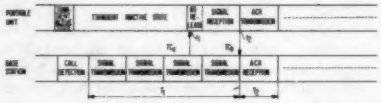
Ryoji Kawasaki, Kanagawa; Kazuhiro Yoshizawa, Chiba; Akio Yotsutani, Tokyo; Noboru Saegusa, Tokyo; Koichi Ito, Tokyo, and Syozi Huse, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation; NEC Corporation and Kabushiki Kaisha Toshiba, all of, Japan

Filed Feb. 26, 1985, Ser. No. 705,944

Claims priority, application Japan, Feb. 29, 1984, 59-38029

Int. Cl.[4] H04B *7/00*

U.S. Cl. 455—54 **4 Claims**



1. A method of calling a portable unit from a base station through a radio control channel, said method comprising the steps of repeatedly producing in said base station a terminating call signal as a call signal sequence, periodically putting said portable unit into transient active and inactive states during a first time interval and during a second time interval following said first time interval, respectively, and keeping said portable unit into a continuous active state when one of said terminating call signals is received during said first time interval, wherein the improvement comprises the steps of:

measuring in said base station a first time duration longer than said second time interval; and

producing said call signal sequence only within said first time duration.

4,679,245

RADIO RECEIVER

Kazuyoshi Imazeki, and Nobuaki Yokoyama, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

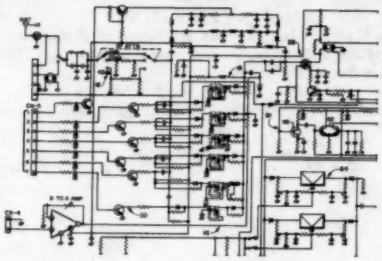
Division of Ser. No. 661,025, Oct. 15, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 853,472

Int. Cl.[4] H04B *1/16*

U.S. Cl. 455—155 **4 Claims**

1. A signal strength meter linearity control system for a radio receiver, said radio receiver including an automatic gain control circuit for producing an automatic gain control signal and a signal strength meter coupled for response to said automatic gain control signal; said control system comprising:

current controlling circuit means coupled with said signal strength meter and responsive to a predetermined current control signal for controlling the current flow through said signal strength meter in a predetermined fashion so as to increase the linear range of response of said signal strength meter to the automatic gain control signal; and signalling circuit means coupled with said automatic gain control circuit and



with said current controlling circuit means and responsive to said automatic gain control signal for producing said predetermined current control signal in a predetermined systematic fashion; wherein said current controlling circuit means comprises resistive means and switching means for alternately switching said resistive means into and out of series circuit with said signal strength meter.

4,679,246

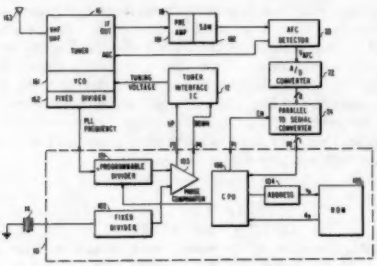
ONE-SHOT TUNING CIRCUIT

Tzong K. Jeng, North Canton, Ohio, assignor to General Electric Company, Portsmouth, Va.

Filed May 1, 1985, Ser. No. 729,336

Int. Cl.[4] H04B *1/16*

U.S. Cl. 455—183 **3 Claims**



1. In a microprocessor controlled phase locked loop tuning system of the type wherein the microprocessor is responsive to a user input station or channel selection to produce an output to a programmable frequency divider in the phase locked loop which determines the nominal local oscillator frequency and the intermediate frequency of the tuning system is detected to produce an error voltage indicative of the deviation of the intermediate frequency from a designed value, the improvement comprising:

analog-to-digital converter means for converting said error voltage to a digital number; and

table look-up means addressed by said digital number for providing an offset value for loading in said programmable frequency divider, said programmable frequency divider thereafter providing an output which determines the final local oscillator frequency and the intermediate frequency of the tuning system to complete the tuning process.

4,679,247

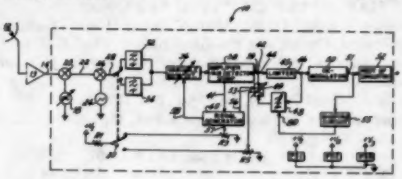
FM RECEIVER

Clyde Washburn, Jr., Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc., Cincinnati, Ohio

Filed Mar. 27, 1985, Ser. No. 717,250

Int. Cl.[4] H04B *1/16*; H03D *3/24*

U.S. Cl. 455—210 **16 Claims**



1. An FM receiver including:

a limiter adapted to receive on a first input an FM signal having a predetermined center frequency, said limiter having a first output;

demodulator means having a second input coupled to said limiter output for providing on a second output signals corresponding to the baseband modulation of said FM signal including the information and the noise therein;

signal shaping means responsive to said demodulator means output signals for providing a first control signal component relatively highly correlated to the noise in said baseband modulation, said first control signal component having a relatively low correlation to said information in said baseband modulation; and

electrically tunable bandpass filter means connected between said limiter output and said limiter input to provide regenerative feedback around said limiter, said electrically tunable bandpass filter means being responsive to said first control signal component whereby said electrically tunable bandpass filter means is tuned, in part, by said noise.

4,679,248

TEST EQUIPMENT FOR SIMULATING MULTIPATH INTERFERENCE

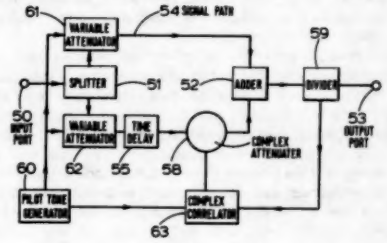
James H. A. McKeown, Ipswich, England, assignor to British Telecommunications public limited company, Great Britain

Filed Apr. 2, 1985, Ser. No. 718,978

Claims priority, application United Kingdom, Apr. 4, 1984, 8408620

Int. Cl.[4] H04B *17/00*

U.S. Cl. 455—226 **26 Claims**



1. Equipment for simulating multipath interference of various depths which comprises:

(a) first means for simulating multipath interference by simulating a deep notch in the frequency domain response of an input signal transmitted therethrough to produce an intermediate signal;

(b) second means for delaying and for combining a delayed or undelayed attenuated copy of said input signal with said intermediate signal to produce an output signal having a

predetermined severity of maximum attenuation at said notch in the frequency domain.

4,679,249

WAVEGUIDE-TO-MICROSTRIP LINE COUPLING ARRANGEMENT AND A FREQUENCY CONVERTER HAVING THE COUPLING ARRANGEMENT

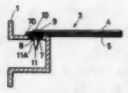
Toshihide Tanaka, Ikoma; Hiroshi Saka, Osaka; Yoshikazu Yoshimura, Osaka, and Yasuhumi Shiomi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

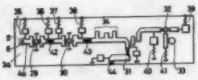
Filed Feb. 14, 1985, Ser. No. 701,912

Claims priority, application Japan, Feb. 15, 1984, 59-26301; Feb. 15, 1984, 59-26302

Int. Cl.[4] H04H 1/26; H01P 5/107

U.S. Cl. 455—328 13 Claims





8. A microwave frequency converter comprising:

(a) a waveguide having a pass band covering an RF signal frequency and a cutoff band covering a local oscillator signal frequency which is lower than that of said RF signal frequency, one end of said waveguide being short-circuited;

(b) a microwave integrated circuit attached to an outer surface of a wall of said waveguide, said microwave integrated circuit having a microstrip line including a ground plane, a dielectric substrate and a center strip conductor which are stacked in sequence, said center strip conductor having a semicircular end whose radius corresponds to one half the width of said center strip conductor, said microstrip line extending along said outer surface of said wall, extending from the short-circuited end of said waveguide such than said ground plane, is in contact with said waveguide;

(c) a metallic post having cylindrical portions, said post having one end adjacent to and connected to said center strip conductor, said metallic post extending from a center of a circle defined by said center conductor, said circle having a half portion which corresponds to said semicircular end of said center conductor, to the inside of said waveguide via circular through-holes made in said dielectric substrate, said ground plane, and said wall of said waveguide, said circular through-holes being coaxial with said metallic post, and the diameter of said circular through-hole made in said ground plane being made smaller than that of said circular through-hole made in said wall of said waveguide, said

cylindrical portions of said metallic post including a large-diameter portion interposed between first and second small-diameter portions;

(d) an annular cylindrical dielectric member fitted in said circular through-hole of said wall of said waveguide such that said first small-diameter portion of said metallic post penetrates said annular cylindrical dielectric member and said annular cylindrical dielectric member is supported by one end surface of said large-diameter portion; and

(e) a local oscillator and a mixer both formed within said microwave integrated circuit for converting said RF signal from said waveguide into an IF signal.

4,679,250

OPTICAL REPEATERS

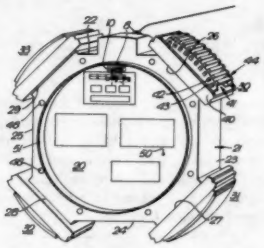
Aurthur A. Davis, Harrold Wood, and Robert W. Eady, London, both of England, assignors to Standard Telephones and Cables plc, London, England

Filed Jan. 18, 1985, Ser. No. 692,394

Claims priority, application United Kingdom, Jan. 19, 1984, 8401432

Int. Cl.[4] H04B 9/00

U.S. Cl. 455—601 6 Claims



1. A digital repeater comprises an outer housing, a chassis within the housing, electrical and opto-electronic components supported on the chassis, said chassis being at a d.c. level diffrent from that of the housing while the repeater is in use, and a plurality of heat transfer arrangements which, when the repeater is in use, transfer heat between the chassis and the housing, each said heat transfer arrangement comprising an electrically insulating heat transfer device able to maintain electrical insulation between the chassis and the housing at a voltage of several thousand volts, and a resiliently-biased metallic element, said insulating hear transfer device being located between the chassis and said resiliently-biassed metallic element and comprising an open-box-shaped heat conductive insulator, said metallic element protruding above and in good heat-transfer-connection with said insulator.

4,679,251

OPTICAL RECEIVER

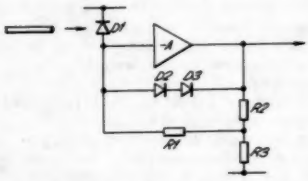
David P. M. Chown, Great Dunmow, Great Britain, assignor to International Standard Elecric Corporation, New York, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,831

Claims priority, application United Kingdom, Sep. 29, 1984, 8424642

Int. Cl.[4] H04B 9/00

U.S. Cl. 455—619 3 Claims



1. An optical receiver for the reception of a modulated light beam, which comprises a PIN diode on to which the modulated light beam is directed to produce therein an electrical

current proportional to the modulated beam, an amplifier to an input of which the diode is connected and the output of which is applied to the detection circuitry of the receiver, a resistive load connected across the amplifier, and the series combination of a non-linear Schottky diode and a PIN diode connected across the resistive load, the two series-connected diodes having their cathodes pointing in the same direction, wherein the Schottky diode acts as a dynamic load to prevent saturation of the amplifier under high input signal conditions and the PIN diode minimizes the deleterious effects of the leakage and self-capacitance characteristics of the Schottky diode.

4,679,252

FIBER OPTIC RECEIVER HAVING A METHOD AND AN APPARATUS FOR DATA CLOCK EXTRACTION

John M. Holland, Shawsville, Va., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 11, 1984, Ser. No. 570,048

Int. Cl.[4] H04D *9/00*

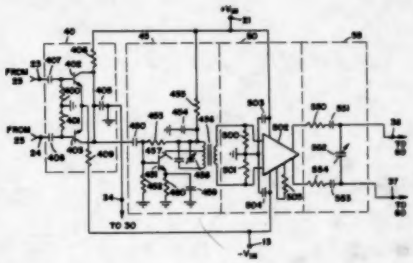
U.S. Cl. 455—619 **8 Claims**

1. A data clock extractor comprising:

a full wave rectifier providing an output signal having peaks indicative of transitions in a data stream;

a peak detector for detecting peaks coupled to receive signals from said full wave rectifier;

an oscillator; and



means, coupled between said peak detector and said oscillator, for synchronizing said oscillator with said peaks from said peak detector to extract a data clock.

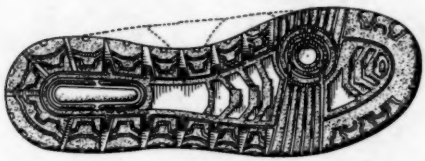
DESIGN PATENTS

GRANTED JUL. 7, 1987

ERRATA

For CLASS	See PATENT NO.
D15-069	290,711

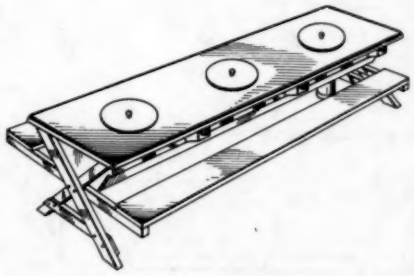
290,660
SHOE SOLE
Lawrence Selbiger, Portland, Oreg., assignor to PENSA, Inc., Portland, Oreg.
Filed Aug. 22, 1986, Ser. No. 898,979
Term of patent 14 years
U.S. Cl. D2—320



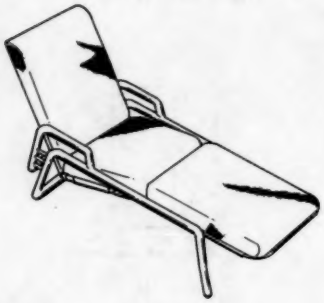
290,661
CARRIER FOR COLORING BOOKS AND CRAYONS
Mel Appel, Livingston, and George Kress, Scotch Plains, both of N.J., assignors to The Mel Appel Company, Short Hills, N.J.
Filed Nov. 19, 1984, Ser. No. 672,947
Term of patent 14 years
U.S. Cl. D3—73

290,662
MIRROR
Vicki L. Basil, 1825 Morton Ave., Los Angeles, Calif. 90026, and Roma Palacios, 444 S. Manhattan Pl., Los Angeles, Calif. 90020
Filed May 15, 1984, Ser. No. 610,515
Term of patent 14 years
U.S. Cl. D6—310

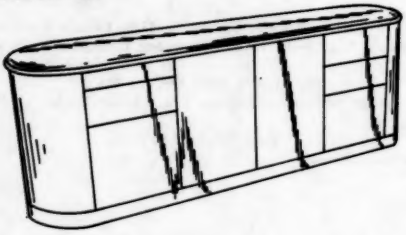
290,663
COMBINED PICNIC TABLE AND BARBEQUE GRILL
Kwan S. Jung, 54-18, 1-Ka, Myong dong, Chung-Ku, Seoul, Rep. of Korea
Filed Jan. 4, 1985, Ser. No. 688,860
Claims priority, application Rep. of Korea, Jul. 5, 1984, 84-7908
Term of patent 14 years
U.S. Cl. D6—337

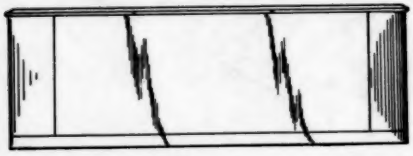


290,664
CHAISE LOUNGE
Babette L. Strousse, Manhattan Beach, and Stephen H. Kaminski, Burbank, both of Calif., assignors to Samsonite Corporation, Denver, Colo.
Filed Sep. 11, 1984, Ser. No. 649,563
Term of patent 14 years
U.S. Cl. D6—361

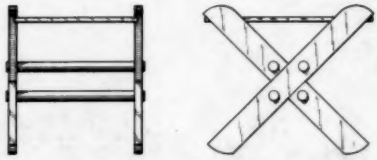


290,665
CREDENZA
Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904
Filed Nov. 16, 1984, Ser. No. 672,014
Term of patent 14 years
U.S. Cl. D6—446

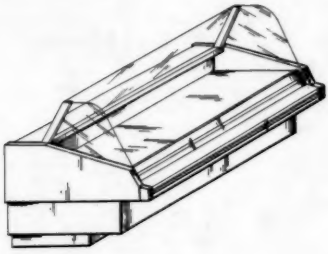




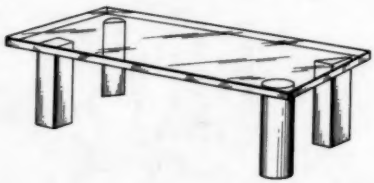
290,666
SUPPORT STAND
Jacob E. Joseph, 3401 S. Salem Church Rd., Dover, Pa. 17315
Filed Feb. 7, 1985, Ser. No. 699,190
Term of patent 14 years
U.S. Cl. D6—449



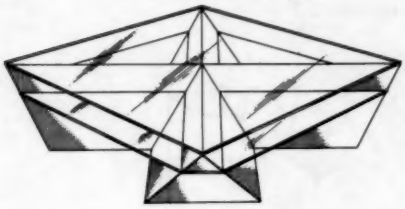
290,667
CHEST FREEZER
Ivano De Zolt, Bribano, Italy, assignor to Costan S.p.A., Italy
Filed Jul. 26, 1984, Ser. No. 634,508
Claims priority, application Italy, Feb. 6, 1984, 20750/84[U]
Term of patent 14 years
U.S. Cl. D6—472



290,668
COFFEE TABLE
Maureen E. Lundy, 2401 Pennsylvania Ave., Wilmington, Del. 19806
Filed Dec. 18, 1984, Ser. No. 682,891
Term of patent 14 years
U.S. Cl. D6—484

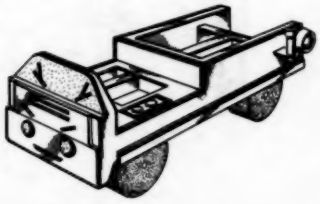


290,669
TABLE
Peter Lacoux, Box 85, Oldwick, N.J. 08858
Filed Feb. 11, 1985, Ser. No. 700,461
Term of patent 14 years
U.S. Cl. D6—488

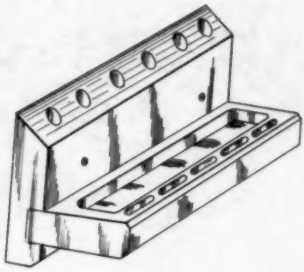


290,670
SLIDE TRACK FOR A DISPENSER FOR CANS OR BOTTLES
Walter Nathan, Glencoe, and Armand S. Zucker, Skokie, both of Ill., assignors to RTC Industries, Inc., Chicago, Ill.
Filed Mar. 26, 1985, Ser. No. 716,327
Term of patent 14 years
U.S. Cl. D6—511

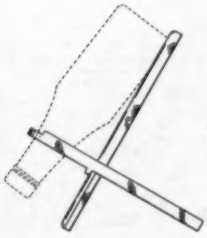
290,671
HOLDER FOR TOOTHBRUSHES, TOOTHPASTE AND OTHER DENTAL ARTICLES
Eric I. Siegel, 2800 Jasmine Ct., NE., Atlanta, Ga. 30345
Filed Sep. 3, 1985, Ser. No. 772,015
Term of patent 14 years
U.S. Cl. D6—527



290,672
COMBINED TRAY AND DART AND COIN HOLDER
Stanley W. Pearson, 1601 Cambridge Dr., Kinston, N.C. 28501
Filed Mar. 3, 1986, Ser. No. 802,515
Term of patent 14 years
U.S. Cl. D6—552



290,673
BOTTLE DRAINER RACK
Alex Imatt, 715 Williamsburg Ct., Oak Brook, Ill. 60521
Filed Jun. 11, 1985, Ser. No. 743,665
Term of patent 14 years
U.S. Cl. D7—70



290,674

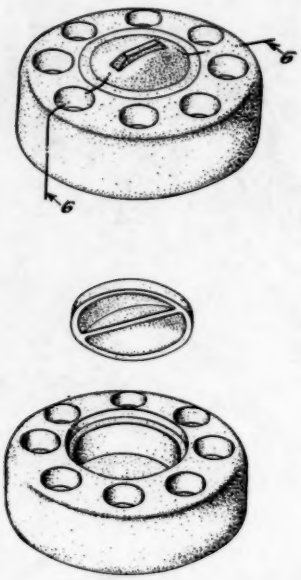
FLOATABLE TRAY FOR BEVERAGE CONTAINERS

Jennifer Valov, 8343 Loch Lomond Dr., Pico Rivera, Calif. 90660

Filed Dec. 17, 1984, Ser. No. 682,748

Term of patent 14 years

U.S. Cl. D7—71



290,675

MICROWAVE OVEN

Jong S. Choi, Kyungki, Rep. of Korea, assignor to Gold Star Company, Ltd., Seoul, Rep. of Korea

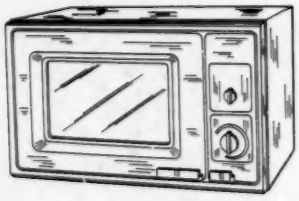
Filed Jul. 5, 1984, Ser. No. 627,903

Claims priority, application Rep. of Korea, Mar. 17, 1984, 2833-84

The portion of the term of this patent subsequent to Aug. 13, 1999, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—351



290,676

FOOD PROCESSOR

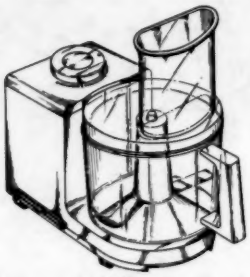
Franz A. Stutzer, and Michael Knochner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 28, 1984, Ser. No. 675,674

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 5MR 10542

Term of patent 14 years

U.S. Cl. D7—384



290,677

FOOD PROCESSOR

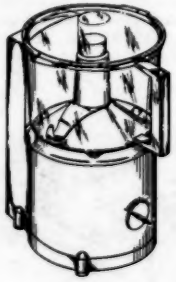
Franz A. Stutzer, and Michael Knocner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 28, 1984, Ser. No. 675,673

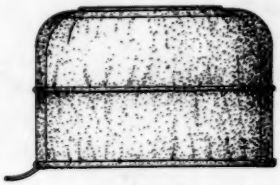
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 5MR 10541

Term of patent 14 years

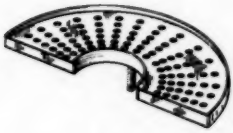
U.S. Cl. D7—384



290,678
BARBECUE PIT COVER
James Johnson, and Edna M. Johnson, both of 1305 Shallowford Rd., Herndon, Va. 22070
Filed Nov. 2, 1983, Ser. No. 482,777
Term of patent 14 years
U.S. Cl. D7—387

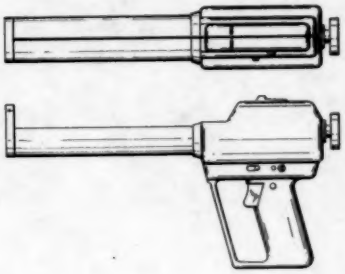


290,679
DRAIN PAN
James E. Thorpe, 1910 Mineola, Colorado Springs, Colo. 80915
Filed Jun. 11, 1984, Ser. No. 619,307
Term of patent 14 years
U.S. Cl. D7—397



290,680
HYDROPONIC WAFER AND WICK THEREFOR OR SIMILAR ARTICLE
R. Louis Ware, 2108 Middlefork, Northfield, Ill. 60093
Filed Nov. 9, 1981, Ser. No. 319,288
Term of patent 14 years
U.S. Cl. D8—1

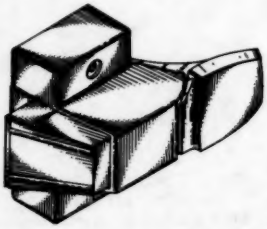
290,681
CAULKING GUN
Horst Pudwill, Stolzestr. 14, 3000 Hannover, Fed. Rep. of Germany
Filed Jun. 19, 1984, Ser. No. 622,153
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 82 MR 2654
Term of patent 14 years
U.S. Cl. D8—14.1



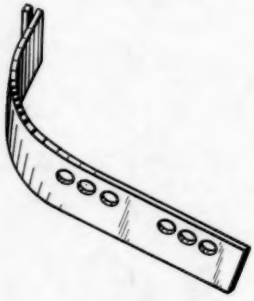
290,682
CORK RETRIEVER
Jay J. Rogers, 205-470 Granville Street, Vancouver, British Columbia, Canada (V6C 1V5)
Filed Jan. 30, 1985, Ser. No. 696,409
Claims priority, application Canada, Aug. 10, 1984, 10-08-84-12
Term of patent 14 years
U.S. Cl. D8—42

290,683
GRAB BAR
Adrian Dartnall, Loughborough, England, assignor to Gordon Ellis & Company, Derbyshire, England
Filed Aug. 9, 1985, Ser. No. 764,190
Claims priority, application United Kingdom, Mar. 1, 1985, 1025345
Term of patent 14 years
U.S. Cl. D8—319

290,684
DOOR LATCH
Leo F. Wildgen, Minneapolis, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.
Filed Dec. 21, 1984, Ser. No. 684,615
Term of patent 14 years
U.S. Cl. D8—331



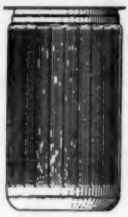
290,685
SHOWER CURTAIN HOLDER
Herbert A. Houston, 1280 Wylie Rd., West Chester, Pa. 19380
Filed Jul. 2, 1984, Ser. No. 627,224
Term of patent 14 years
U.S. Cl. D8—368



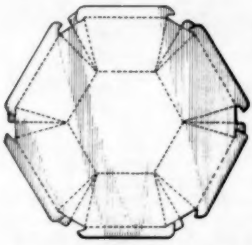
290,686
BOTTLE
John R. Board, Sherburn in Elmet, England, assignor to Samuel Smith Old Brewery, Tadcaster, England
Filed Oct. 29, 1984, Ser. No. 665,956
Claims priority, application United Kingdom, Aug. 29, 1984, 1021767
Term of patent 14 years
U.S. Cl. D9—355

290,687
PERFUME BOTTLE
Jacques Llorente, La Garenne Colombes, France, assignor to Comptoir Nouveau de la Parfumerie, Paris, France
Filed Jan. 23, 1985, Ser. No. 693,943
Claims priority, application France, Aug. 2, 1984, 843 466
Term of patent 14 years
U.S. Cl. D9—385

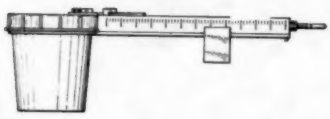
290,688
CAN
Thomas E. Moloney, Wheaton; Nelson N. Chernikoff, Richton Park; Edward S. Traczyk, Lockport; Michael M. Shulski, Northfield; Edward K. Cassidy, Palatine, and John M. Mann, Downers Grove, all of Ill., assignors to National Can Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 523,514, Aug. 15, 1983, Pat. No. Des. 283,011. This application Mar. 28, 1984, Ser. No. 594,610
Term of patent 14 years
U.S. Cl. D9—398



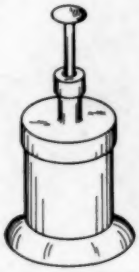
290,689
BLANK FOR HEXAGONAL TRAY
Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Mar. 21, 1985, Ser. No. 714,204
Term of patent 14 years
U.S. Cl. D9—433



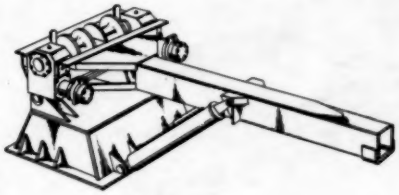
290,690
SEED SCALE
James W. McDowell, General Delivery, Gordondale, Alberta, Canada (T0H 1V0)
Filed Dec. 3, 1984, Ser. No. 677,944
Term of patent 14 years
U.S. Cl. D10—90



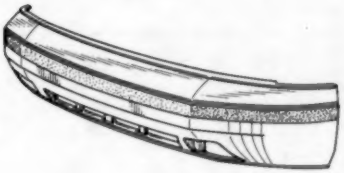
290,691
BINGO CHIP BELL
William Coralline, 5235 W. Wabash Ave., Brown Deer, Wis. 53223
Filed Dec. 18, 1984, Ser. No. 683,001
Term of patent 14 years
U.S. Cl. D10—116



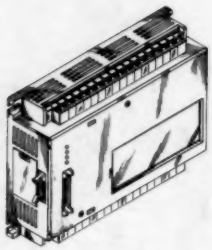
290,692
HYDRAULIC WRECKER AND BOOM HOUSING
Fleming V. Cannon, Jr., Flintstone, Ga., assignor to Dover Corporation, Chattanooga, Tenn.
Filed Dec. 14, 1984, Ser. No. 681,900
Term of patent 14 years
U.S. Cl. D12—14



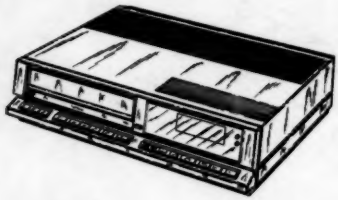
290,693
FRONT BUMPER FOR AN AUTOMOBILE
Tokuo Fukuichi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 5, 1985, Ser. No. 762,538
Term of patent 14 years
U.S. Cl. D12—169



290,694
PROGRAMMABLE CONTROLLER
Norio Shimizu, and Yuichi Watanabe, both of Tokyo, Japan, assignors to Koyo Electronics Industries Co., Ltd., Tokyo, Japan
Filed Jan. 29, 1985, Ser. No. 696,192
Claims priority, application Japan, Aug. 27, 1984, 59-35404
Term of patent 14 years
U.S. Cl. D13—12

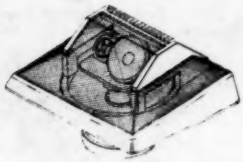


290,695
VIDEO CASSETTE RECORDER
Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 27, 1985, Ser. No. 716,889
Claims priority, application United Kingdom, Oct. 12, 1984, 1.022.653
Term of patent 14 years
U.S. Cl. D14—2

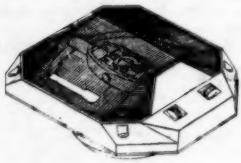


290,696
COMBINED CHECKBOOK HOLDER WITH TIMEPIECE
Eric W. Lund, and Raymond W. Young, both of West Bend, Wis., assignors to Amity Leather Products Company, West Bend, Wis.
Filed Sep. 4, 1984, Ser. No. 647,103
Term of patent 14 years
U.S. Cl. D19—11

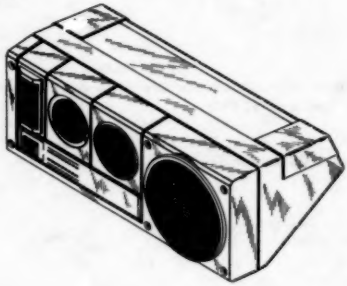
290,697
SPEAKER
Akio Tanaka, Aichi, and Akira Katsuno, Tokyo, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Oct. 22, 1984, Ser. No. 663,621
Claims priority, application Japan, Apr. 25, 1984, 59-16981
Term of patent 14 years
U.S. Cl. D14—30



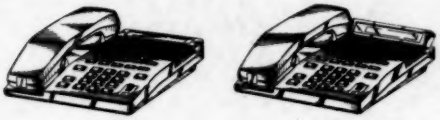
290,698
LOUDSPEAKER
You Takagi, Kanagawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Nov. 28, 1984, Ser. No. 675,588
Claims priority, application Japan, May 30, 1984, 59-22075
Term of patent 14 years
U.S. Cl. D14—30



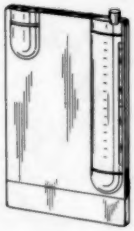
290,699
LOUDSPEAKER
Hitoshi Nakamura, and Tetsuo Ohtsuji, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Oct. 11, 1984, Ser. No. 659,758
Claims priority, application Japan, Apr. 12, 1984, 59-14684
Term of patent 14 years
U.S. Cl. D14—34



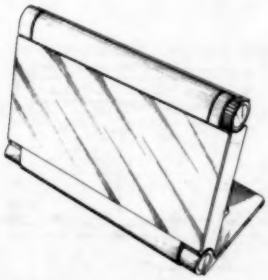
290,700
TELEPHONE SET
Richard Lindahl, Malmoe, Sweden, assignor to Televerket, Farsta, Sweden
Filed Mar. 27, 1985, Ser. No. 716,420
Claims priority, application Sweden, Oct. 1, 1984, M84-2627
Term of patent 14 years
U.S. Cl. D14—53



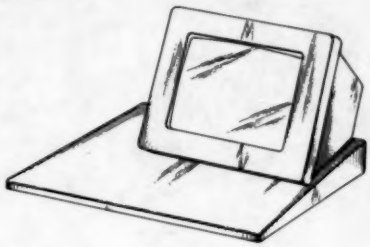
290,701
RADIO TUNER
Masanori Hamada; Takao Okada; Takako Uchida, all of Osaka, and Kikuo Ohta, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 22, 1984, Ser. No. 663,618
Claims priority, application Japan, May 8, 1984, 59-18718
Term of patent 14 years
U.S. Cl. D14—68



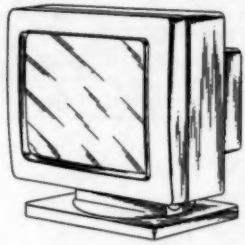
290,702
DISPLAY TERMINAL
Timothy R. Stern, Southfield, Mich., and Vladimir Selepouchin, Cedar Grove, N.J., assignors to Burroughs Corporation, Detroit, Mich.
Filed Dec. 19, 1984, Ser. No. 683,683
Term of patent 14 years
U.S. Cl. D14—113



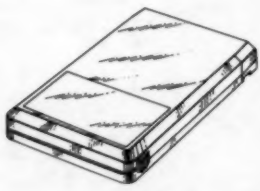
290,703
COMPUTER DISPLAY TERMINAL OR SIMILAR ARTICLE
Alvin D. Day, San Jose, Calif.; Stephen G. Miggels, Wyckoff, N.J.; Michael J. Nuttall, Palo Alto, Calif., and Gordon E. Sylvester, Jamaica, N.Y., assignors to American Telephone and Telegraph Company, New York, N.Y.; AT&T Information Systems Inc., Morristown, N.J. and Convergent Technologies, Inc., Santa Clara, Calif.
Filed Mar. 22, 1985, Ser. No. 715,191
Term of patent 14 years
U.S. Cl. D14—113



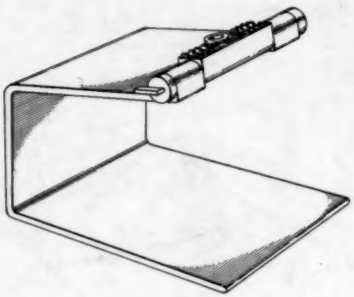
290,704
CRT DISPLAY MONITOR OR SIMILAR ARTICLE
David L. Schaum, Woodstock, N.Y., and Joseph P. Taylor, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 10, 1985, Ser. No. 733,277
Term of patent 14 years
U.S. Cl. D14—113



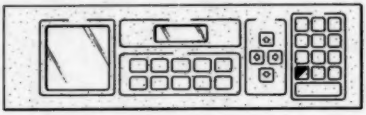
290,705
ROM CARTRIDGE FOR LASER BEAM PRINTER
Takashi Yomo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 29, 1984, Ser. No. 614,764
Claims priority, application Japan, Dec. 1, 1983, 58-52188
Term of patent 14 years
U.S. Cl. D14—114



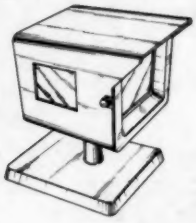
290,706
MONITOR STAND
Stephen Peart, Los Gatos, and Man Van-Dinh, Campbell, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Apr. 20, 1984, Ser. No. 602,655
Term of patent 14 years
U.S. Cl. D14—114



290,707
KEYBOARD AND DISPLAY PANEL FOR INTERSECTION CONTROLLER
Robert S. Allen, Livermore; Richard G. Freeman, Pleasanton, and Thomas W. Seabury, Diablo, all of Calif., assignors to Multisonics, Inc., Dublin, Calif.
Filed May 23, 1984, Ser. No. 613,129
Term of patent 14 years
U.S. Cl. D14—115



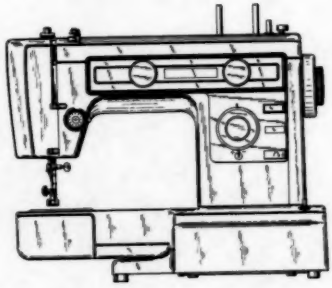
290,708
APPARATUS FOR CONVERTING MOVIE FILMS TO VIDEO TAPE
Arthur Rea, Oyster Bay, N.Y., assignor to B.P. Electronics, Inc., Hauppauge, N.Y.
Filed Jan. 10, 1985, Ser. No. 690,139
Term of patent 14 years
U.S. Cl. D16—14



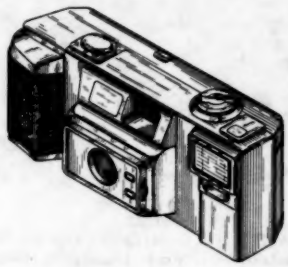
290,709
SHOULDER-STOCK SCOPE AND CAMERA MOUNT
John D. Hedrick, 11304 Redcedar Dr., San Diego, Calif. 92131
Filed Apr. 23, 1985, Ser. No. 726,696
Term of patent 14 years
U.S. Cl. D16—44

290,710
ATHLETIC GOGGLES
Alvino Aliberti, 64 Mill St., Southbridge, Mass. 01550
Filed Jul. 16, 1984, Ser. No. 631,409
Term of patent 14 years
U.S. Cl. D16—107

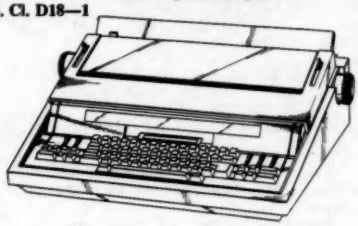
290,711
SEWING MACHINE
Koji Uchida, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Feb. 27, 1984, Ser. No. 584,093
The portion of the term of this patent subsequent to Jun. 9, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—69



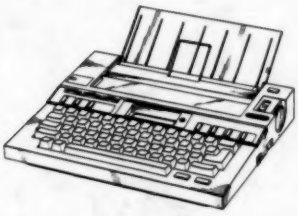
290,712
CAMERA
Tom Y. Shis, Taipei, Taiwan, assignor to Wizen Industry Co., Ltd., Taipei, Taiwan
Filed Sep. 13, 1984, Ser. No. 650,054
Term of patent 14 years
U.S. Cl. D16—6



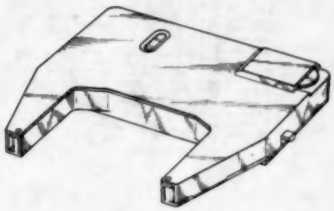
290,713
TYPEWRITER
Isshin Miyamoto; Yasuo Nagamatsu; Toshiya Miroyama, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 29, 1985, Ser. No. 696,128
Claims priority, application Japan, Jul. 31, 1984, 59-32913
Term of patent 14 years
U.S. Cl. D18—1



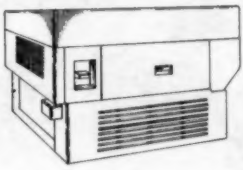
290,714
COMBINED TYPEWRITER AND GRAPHMAKER
Isshin Miyamoto; Yasuo Nagamatsu; Toshiya Moriyama, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 25, 1985, Ser. No. 694,736
Claims priority, application Japan, Jul. 30, 1984, 59-32297
Term of patent 14 years
U.S. Cl. D18—1



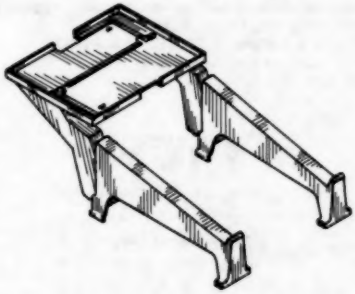
290,715
INK RIBBON CASSETTE
Seiichi Omino, Tokyo, and Noboru Shimoyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 17, 1985, Ser. No. 745,224
Claims priority, application Japan, Dec. 20, 1984, 59-52575
Term of patent 14 years
U.S. Cl. D18—12



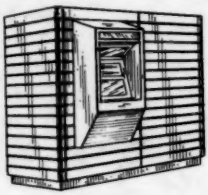
290,716
LASER PRINTER
Stephen Peart, Los Gatos; Sigmar Willnauer, Campbell, and Terrence B. Christensen, Mountain View, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Jul. 2, 1985, Ser. No. 751,316
Term of patent 14 years
U.S. Cl. D18—13



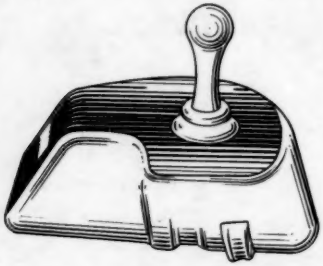
290,717
PRINTER STAND
Thomas W. Judd, Peterborough, N.H., assignor to Curtis Manufacturing Company, Inc., Peterborough, N.H.
Filed Nov. 3, 1986, Ser. No. 926,408
Term of patent 14 years
U.S. Cl. D18—23



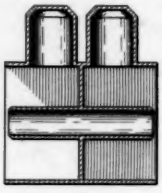
290,718
VENDING MACHINE
Kim D. Nyegaard, and Ib Nyegaard, both of 8380 Miramar Rd., #200, San Diego, Calif. 92126
Filed Sep. 27, 1984, Ser. No. 655,143
Term of patent 14 years
U.S. Cl. D20—1



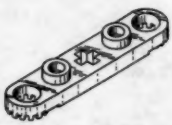
290,719
COMPUTER JOYSTICK
Wynford Holloway, Wavell Close, United Kingdom, assignor to Creative Devices Research, Ltd., Tredegar Gwent, United Kingdom
Filed May 8, 1986, Ser. No. 862,396
Term of patent 14 years
U.S. Cl. D21—48



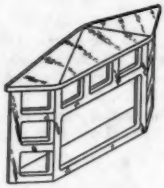
290,720
TOY CONSTRUCTION BLOCK
Vic Bertrand, Dollard-des-Ormeaux, Canada, assignor to The Ritvik Group Inc., Dorval, Canada
Filed Dec. 2, 1985, Ser. No. 803,479
Term of patent 14 years
U.S. Cl. D21—108



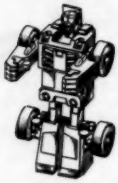
290,721
TOY CONSTRUCTION PIECE
Jan Ryan, Billund, and Ole V. Poulsen, Vejle, both of Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1985, Ser. No. 805,308
Term of patent 14 years
U.S. Cl. D21—108



290,722
SIMULATIVE TOY CONSTRUCTION ELEMENT
Philip M. Kushner, Greve Strand, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1985, Ser. No. 805,350
Term of patent 14 years
U.S. Cl. D21—108



290,723
RECONFIGURABLE TOY VEHICLE
Akio Kitamura, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 21, 1985, Ser. No. 715,064
Claims priority, application Japan, Oct. 25, 1984, 59-44102
Term of patent 14 years
U.S. Cl. D21—150



290,724
DOLL
Howard N. Bollinger; Susan M. Holthaus; Cathy L. Veness; Andrea McSweeney, all of Cincinnati, Ohio; Cheryl L. Cozad, Lenexa, Kans., and Yacoba C. Oliver, Raytown, Mo., assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Feb. 8, 1985, Ser. No. 699,693
Term of patent 14 years
U.S. Cl. D21—166

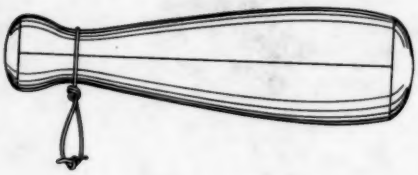
290,725
DOLL
Howard N. Bollinger; Susan M. Holthaus; Cathy L. Veness; Jane C. Abbott, all of Cincinnati, Ohio; Michael J. Spindle, Camarillo, Calif.; Cheryl L. Cozad, Lenexa, Kans.; Yacoba C. Oliver, Raytown; Geraldine Oliveira, Kansas City, both of Mo., and Jeanne Slater, Fairway, Kans., assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Feb. 8, 1985, Ser. No. 699,697
Term of patent 14 years
U.S. Cl. D21—166

290,726
DOLL
Howard N. Bollinger; Susan M. Holthaus; Cathy L. Veness; Jane C. Abbott, all of Cincinnati, Ohio; Michael J. Spindle, Camarillo, Calif.; Cheryl L. Cozad, Lenexa, Kans.; Yacoba C. Oliver, Raytown; Geraldine Oliveira, Kansas City, both of Mo., and Jeanne Slater, Fairway, Kans., assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Feb. 8, 1985, Ser. No. 699,691
Term of patent 14 years
U.S. Cl. D21—166

290,727
CLOWN IN A BARREL FIGURE
Patrick Rylands, London, England, assignor to Simon Gompes
Filed Dec. 31, 1984, Ser. No. 687,917
Term of patent 14 years
U.S. Cl. D21—173

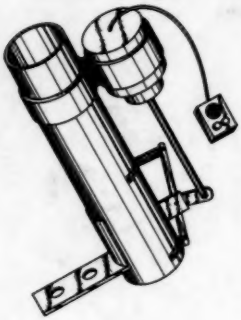
290,728
INFLATABLE CLUB
Henry L. Einhorn, 3446 Page St., San Diego, Calif. 92115
Filed Oct. 19, 1984, Ser. No. 662,904
Term of patent 14 years
U.S. Cl. D21—211

290,729
INFLATABLE CLUB
Henry L. Einhorn, 3446 Page St., San Diego, Calif. 92115
Filed Oct. 22, 1984, Ser. No. 663,553
Term of patent 14 years
U.S. Cl. D21—211



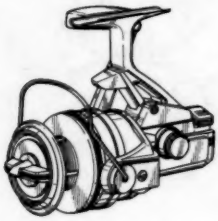
290,730
GOLF CLUB GRIP
Karsten Solheim, 501 Wakonda La., Phoenix, Ariz. 85023
Filed Feb. 7, 1985, Ser. No. 699,329
Term of patent 14 years
U.S. Cl. D21—222

290,731
BUOY MARKER LAUNCHER
Albert E. Canady, P.O. Box 282, Midland, Ind. 47445
Filed Oct. 26, 1984, Ser. No. 665,147
Term of patent 14 years
U.S. Cl. D22—113



290,732
FISHING REEL SPOOL
Kaname Yamaguchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Dec. 28, 1984, Ser. No. 687,399
Claims priority, application Japan, Jul. 17, 1984, 59-29756
Term of patent 14 years
U.S. Cl. D22—137

290,733
FISHING REEL
Kanji Iinuma, Tokyo, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan
Filed Nov. 28, 1984, Ser. No. 675,590
Claims priority, application Japan, May 28, 1984, 59-21702
Term of patent 14 years
U.S. Cl. D22—141



290,734
FISHING ROD
Yoshiyuki Matsui, Higashi-Kurume, Japan, assignor to Daiwa Seiko, Inc., Japan
Filed Oct. 30, 1984, Ser. No. 666,294
Claims priority, application Japan, May 2, 1984, 59-17864
Term of patent 14 years
U.S. Cl. D22—142

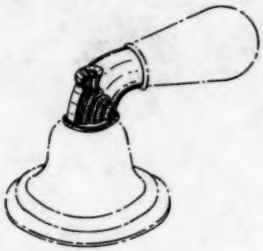
290,735
FISHING ROD
Yoshiyuki Matsui, Higashi-kurume, Japan, assignor to Daiwa Seiko, Inc., Japan
Filed Oct. 30, 1984, Ser. No. 666,549
Claims priority, application Japan, May 2, 1984, 59-17862
Term of patent 14 years
U.S. Cl. D22—142

290,736
HANDLE FOR A FAUCET
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Jul. 12, 1985, Ser. No. 754,604
Term of patent 14 years
U.S. Cl. D23—28

290,737
FAUCET HANDLE
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Jul. 12, 1985, Ser. No. 754,605
Term of patent 14 years
U.S. Cl. D23—29

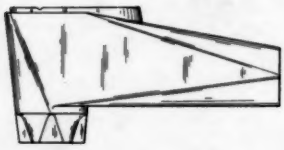
290,738
FAUCET HANDLE
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Oct. 3, 1985, Ser. No. 784,327
Term of patent 14 years
U.S. Cl. D23—29

290,739
HEAD FOR A FAUCET HANDLE
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Dec. 6, 1985, Ser. No. 806,087
Term of patent 14 years
U.S. Cl. D23—29

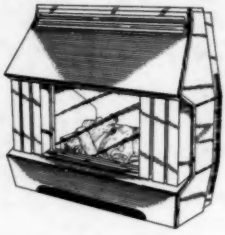


290,740
FAUCET HANDLE
Holly K. Yost, Van Nuys, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.
Filed Mar. 7, 1985, Ser. No. 709,126
Term of patent 14 years
U.S. Cl. D23—29

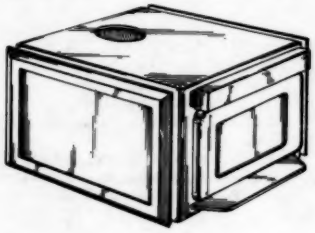
290,741
SINK SPRAYER
Larry I. Fairchild, New Wilmington, Pa., assignor to Universal-Rundle Corporation, New Castle, Pa.
Filed Nov. 12, 1985, Ser. No. 804,800
Term of patent 14 years
U.S. Cl. D23—35



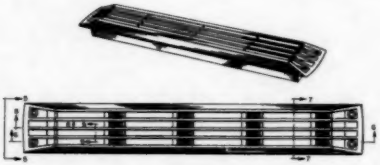
290,742
GAS FIRE
Roger Tucker, Kidderminster; Paul A. Gillam, Great Barr; Peter Wright, Sutton Coldfield; Donald Whitehouse, Castle Bromwich; Michael C. Broadbent, West Heath, and Charles Moran, Willenhall, all of England, assignors to Valor Heating Limited, London, England
Filed Mar. 20, 1985, Ser. No. 714,074
Claims priority, application United Kingdom, Oct. 3, 1984, 1022430; Nov. 7, 1984, 1023151
Term of patent 14 years
U.S. Cl. D23—97



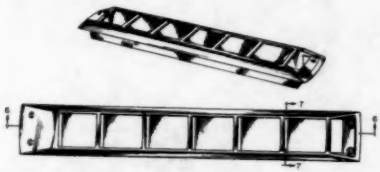
290,743
HEATING STOVE
Graeme J. Ord, and Robert N. Lockhart, both of Auckland, New Zealand, assignors to Kent Heating Limited, Mangere, New Zealand
Filed Nov. 14, 1984, Ser. No. 671,285
Claims priority, application New Zealand, May 18, 1984, 19109
Term of patent 14 years
U.S. Cl. D23—97



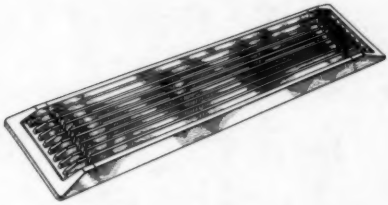
290,744
VENTURI LOUVERED VENT
Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed May 6, 1985, Ser. No. 730,795
Term of patent 14 years
U.S. Cl. D23—115



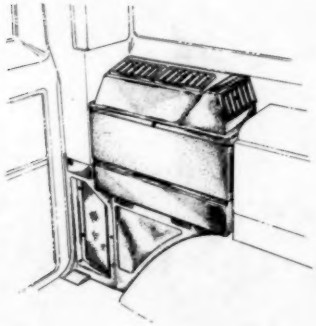
290,745
LOUVERED BOAT VENT
Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed May 6, 1985, Ser. No. 730,801
Term of patent 14 years
U.S. Cl. D23—115



290,746
LOUVERED VENT FOR BOATS
Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Aug. 1, 1986, Ser. No. 891,678
Term of patent 14 years
U.S. Cl. D23—115



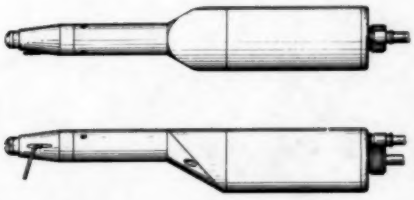
290,747
HOUSING FOR AUTOMOTIVE AIR CONDITIONER
Robert H. Tigner, Arlington, and Carl C. Richardson, Fort Worth, both of Tex., assignors to A.R.A. Manufacturing Company of Delaware, Inc., Grand Prairie, Tex.
Filed Nov. 1, 1985, Ser. No. 794,405
Term of patent 14 years
U.S. Cl. D23—142



290,748
COMBINED CEILING FAN AND LIGHT
Yuzo Kawai, Naraken, Japan, assignor to Kabushiki Kaisha Suiden, Tennojiku, Japan
Filed Sep. 30, 1985, Ser. No. 781,877
Claims priority, application Japan, May 30, 1985, 60-22767
Term of patent 14 years
U.S. Cl. D23—158

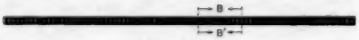
290,749
CENTRIFUGE
Günter Eberle, Tuttlingen, Fed. Rep. of Germany, assignor to Firma Andreas Hettich, Tuttlingen, Fed. Rep. of Germany
Filed Oct. 29, 1984, Ser. No. 645,971
Term of patent 14 years
U.S. Cl. D24—22

290,750
SURGICAL SAW HANDPIECE
Paul DiCarlo, Jacksonville, Fla., and John Halt, Aurora, Colo., assignors to Xomed Inc., Jacksonville, Fla.
Filed May 3, 1984, Ser. No. 606,792
Term of patent 14 years
U.S. Cl. D24—28

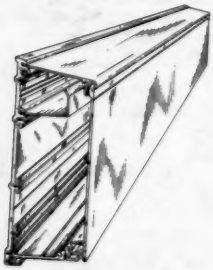


290,751
ELECTRICAL BODY STIMULATOR
Anthony P. Montalbano, Glen Cove, and David E. Conroy, City Island, both of N.Y., assignors to Biolectron, Inc., Hackensack, N.J.
Filed May 7, 1984, Ser. No. 607,460
Term of patent 14 years
U.S. Cl. D24—41

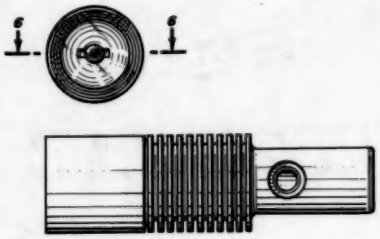
290,752
SYNTHETIC RESIN TUBE
Koui Inoue, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Oct. 22, 1984, Ser. No. 663,725
Claims priority, application Japan, Jul. 25, 1984, 59-31236
Term of patent 14 years
U.S. Cl. D25—73



290,753
PANEL
Lars A. H. Nilsson, Bagshot, England, assignor to M.T.D. Medical Technology and Development Ltd., Nicosia, Cyprus
Filed Mar. 21, 1984, Ser. No. 591,700
Claims priority, application Sweden, Sep. 21, 1983, 83-2433
Int. Cl. D25—*80*
Term of patent 14 years
U.S. Cl. D25—80

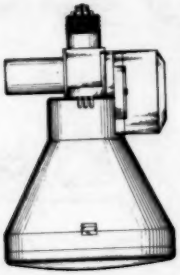


290,754
LIGHTING FIXTURE
Hiroshi Kira, 6135 Fairview Pl., Agoura, Calif. 91301
Filed May 17, 1985, Ser. No. 735,271
Term of patent 14 years
U.S. Cl. D26—24

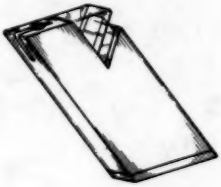


290,755
MINI FLUORESCENT LANTERN
Kung C. Hung, Tsuen Wan, Hong Kong, assignor to Freezinhot Bottle Co., Ltd., Tsuen Wan, Hong Kong
Filed Sep. 27, 1984, Ser. No. 655,054
Claims priority, application United Kingdom, Sep. 4, 1984, 1021889
Term of patent 14 years
U.S. Cl. D26—42

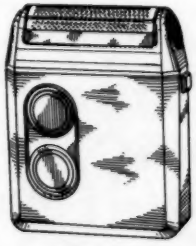
290,756
FLUORESCENT LIGHT FOR RECESSED LIGHTING OR THE LIKE
Roy K. Fujitaki, Altadena, and Hiroshi Fukushima, Monterey Park, both of Calif.
Filed Aug. 16, 1984, Ser. No. 641,533
Term of patent 14 years
U.S. Cl. D26—74



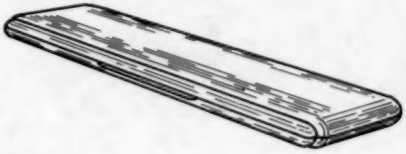
290,757
LIGHTER
Franz A. Stützer, Offenbach am Main, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Jul. 23, 1985, Ser. No. 758,212
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 5 MR 10587
Term of patent 14 years
U.S. Cl. D27—36



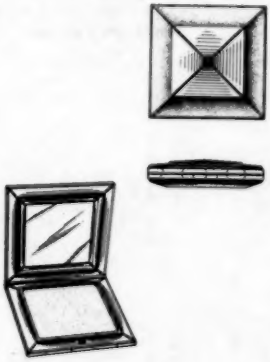
290,758
ELECTRIC SHAVER
Toyomi Arita, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Japan
Filed Mar. 21, 1985, Ser. No. 714,718
Claims priority, application Japan, Sep. 27, 1984, 59-40169
Term of patent 14 years
U.S. Cl. D28—49



290,759
CASE FOR COSMETIC PRODUCTS
Roberto Trabattoni, Petit-Lancy, Switzerland, assignor to Trasi S.A., Petit-Lancy, Switzerland
Filed Aug. 14, 1984, Ser. No. 640,691
The portion of the term of this patent subsequent to Dec. 9, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—83



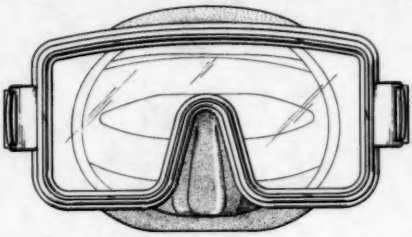
290,760
COMPACT
Janis Goberman, New York, N.Y., assignor to L'Oreal, S.A., Paris, France
Filed Feb. 4, 1985, Ser. No. 697,780
Term of patent 14 years
U.S. Cl. D28—83



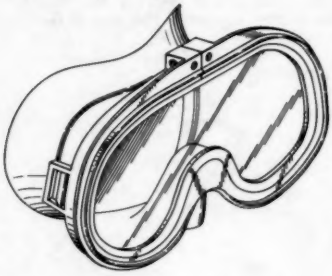
290,761
COSMETIC COMPACT
Janis Goberman, New York, N.Y., assignor to L'Oreal, S.A., Paris, France
Filed Jun. 12, 1985, Ser. No. 744,111
Term of patent 14 years
U.S. Cl. D28—83

290,762
LIPSTICK DISPENSER
Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Jun. 10, 1985, Ser. No. 742,932
Term of patent 14 years
U.S. Cl. D28—89

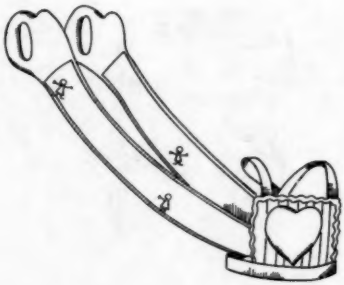
290,763
DIVING MASK
Mark L. Walsh, Chicago, Ill., assignor to Dacor Corporation, North Chicago, Ill.
Filed Apr. 30, 1984, Ser. No. 605,145
Term of patent 14 years
U.S. Cl. D29—9



290,764
AVIATOR-STYLE SWIM MASK
Steven M. Berenson, Sharon, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed Feb. 25, 1985, Ser. No. 704,604
Term of patent 14 years
U.S. Cl. D29—9



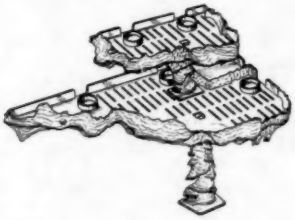
290,765
CHILD RESTRAINT HARNESS
Anne E. Callahan, 1618 Peruvian La., Winter Park, Fla. 32792
Filed Aug. 13, 1984, Ser. No. 639,707
Term of patent 14 years
U.S. Cl. D29—11



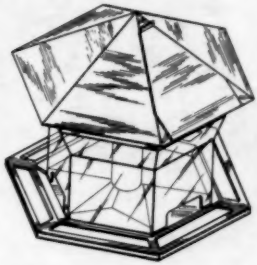
290,766
FOREARM PROTECTOR
Alfred R. Pierce, Jr., 25 Argyle Ave., Blackwood, N.J. 08012
Filed Dec. 31, 1984, Ser. No. 687,746
Term of patent 14 years
U.S. Cl. D29—20

290,767
COMBINED CAT HOUSE AND PLATFORM
Michael A. Duffek, 1240 Hadsell Ave., Vineland, N.J. 08360
Filed Aug. 12, 1985, Ser. No. 764,307
Term of patent 14 years
U.S. Cl. D30—1

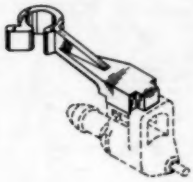
290,768
SHELF UNIT FOR AQUARIUMS
Jerome Goldman, New York; Marvin Goldman, Great Neck; Gerald Philips, Glen Cove, and Joseph Pesin, Brooklyn, all of, NY, assignors to Penn Plax Plastics, Inc., Garden City, N.Y.
Filed Sep. 20, 1984, Ser. No. 652,634
Term of patent 14 years
U.S. Cl. D30—12



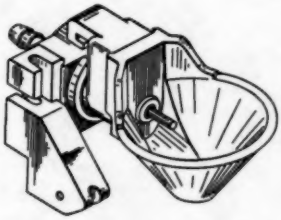
290,769
BIRD FEEDER
William D. Taylor, Whitefish, Mont., assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jun. 15, 1984, Ser. No. 621,281
Term of patent 14 years
U.S. Cl. D30—13



290,770
STABILIZING ARM FOR POULTRY WATERING UNITS
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.
Filed Jan. 24, 1985, Ser. No. 694,416
Term of patent 14 years
U.S. Cl. D30—13

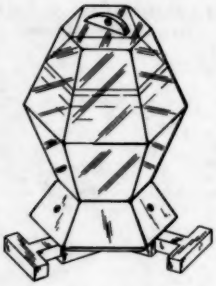


290,771
CAGE MOUNTED POULTRY WATERING UNIT
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.
Division of Ser. No. 688,363, Jan. 2, 1985. This application Nov. 19, 1986, Ser. No. 932,385
Term of patent 14 years
U.S. Cl. D30—14



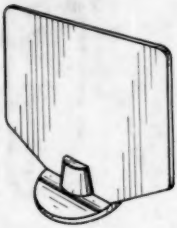
290,772
SUPPORT BRACKET FOR A CAGE MOUNTED POULTRY WATERING DEVICE OR SIMILAR ARTICLE
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.
Division of Ser. No. 688,363, Jan. 2, 1985. This application Nov. 19, 1986, Ser. No. 932,387
Term of patent 14 years
U.S. Cl. D30—14

290,773
BIRD FEEDER OR SIMILAR ARTICLE
Frederic J. Liethen, P.O. Box 296, Appleton, Wis. 54912
Filed Apr. 4, 1985, Ser. No. 719,871
Term of patent 14 years
U.S. Cl. D30—15

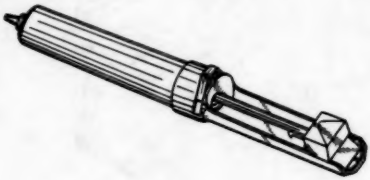


290,774
COMBINED SUPPORT BRACKET AND HOLDER FOR A CAGE MOUNTED WATERING UNIT
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.
Division of Ser. No. 688,363, Jan. 2, 1985. This application Nov. 19, 1986, Ser. No. 932,386
Term of patent 14 years
U.S. Cl. D30—14

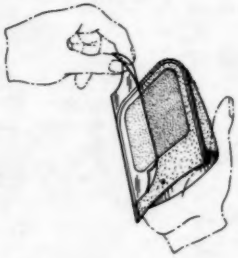
290,775
EAR TAG
Michael J. Scott, Feilding, New Zealand, assignor to Allflex International Limited, New Zealand
Filed Mar. 29, 1984, Ser. No. 594,753
Claims priority, application New Zealand, Oct. 3, 1983, 18644
Term of patent 14 years
U.S. Cl. D30—43



290,776
SUCTION TOOL FOR REMOVING TIN DURING DESOLDERING OPERATION
Rolf Wallin, Järfälla, Sweden, assignor to Rolf Lundell, Jarfalla, Sweden
Filed Apr. 10, 1984, Ser. No. 598,720
Term of patent 14 years
U.S. Cl. D32—17



290,777
POLISH APPLICATOR MITT
Peter P. Lee, 2267 Clementina Dr., Hacienda Heights, Calif. 91745
Filed Apr. 22, 1985, Ser. No. 725,476
Term of patent 14 years
U.S. Cl. D32—40



290,778

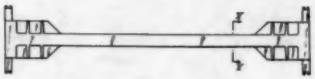
BAKERY BASKET

Charles P. Tabler, Hamilton, Ohio, assignor to Buckhorn Material Handling Group Inc., Cincinnati, Ohio and Ekco Products, Inc., Wheeling, Ill.

Continuation-in-part of Ser. No. 591,874, Mar. 21, 1984, Pat. No. 4,600,103. This application May 29, 1984, Ser. No. 615,103

Term of patent 14 years

U.S. Cl. D34—40



290,779

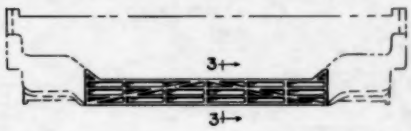
FRONT PANEL FOR A BAKERY PRODUCT CONTAINER OR SIMILAR ARTICLE

Elsmer W. Kreeger, Howell, Mich., assignor to Pinckney Molded Plastics, Inc., Howell, Mich.

Filed Dec. 31, 1984, Ser. No. 687,926

Term of patent 14 years

U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Malik, Arshad H.; Urfer, Allen D.; McDaniel, Robert S.; and Johnson, Donald L., 4,678,595, Cl. 252-174.170.

A S Kongsberg Vapenfabrikk: *See*—
Mowill, Rolf J., 4,678,396, Cl. 415-148.000.

Aalto, Erkki; and Yla-Hemmila, Veikko, to Halton Oy. Flow regulator. 4,678,005, Cl. 137-499.000.

Aavid Engineering, Inc.: *See*—
Johnson, Philip A.; and McCarthy, Alfred F., 4,679,118, Cl. 361-386.000.

AB Celleco: *See*—
Frykhult, Rune H., 4,678,575, Cl. 210-327.000.

Abdel-Monem, Mahmoud M., to Zinpro Corporation. Cobalt complexes and their use as nutritional supplements. 4,678,854, Cl. 556-149.000.

Abe, Hisamasa: *See*—
Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Abe, Hisamasa, 4,678,742, Cl. 430-523.000.

Abe, Tatsuhiko: *See*—
Yamada, Keiichi; and Abe, Tatsuhiko, 4,678,160, Cl. 251-129.020.

Abiko, Toshio: *See*—
Yabu, Yasuo; Abiko, Toshio; and Matsuo, Masayuki, 4,679,051, Cl. 343-700.0MS.

Abowitz, Gerald, to Xerox Corporation. Corrosion resistant aperture plate for ink jet printers. 4,678,680, Cl. 427-38.000.

Abuyama, Yasuo, to Kabushiki Kaisha Toshiba. Image forming apparatus adapted to enter an interrupt copying mode and an energy saving mode. 4,678,316, Cl. 355-14.00C.

ACF Industries, Incorporated: *See*—
Dugge, Richard H.; and Cordani, Eugene J., 4,677,917, Cl. 105-248.000.

Aciers et Outillage Peugeot: *See*—
Escaravage, Gerard, 4,677,715, Cl. 24-637.000.
Monsigny, Jean, 4,677,716, Cl. 24-641.000.
Rudi, Alain; and Bertot, Maurice, 4,678,906, Cl. 250-227.000.

Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibatani, Juichi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Sealing boot for use in disc brake assembly. 4,678,064, Cl. 188-73.450.

Adams, John L.: *See*—
Booth, David E.; Smith, Steven G.; and Adams, John L., 4,678,448, Cl. 445-60.000.

Adell, Robert, to U.S. Product Development Company. Door edge guard. 4,677,790, Cl. 49-462.000.

Adleman, George L.: *See*—
Neil, Robert B.; and Adleman, George L., 4,679,039, Cl. 340-728.000.

Advanced Energy, Inc.: *See*—
Reese, George; Spielmaker, Richard; and Schatz, Douglas, 4,679,007, Cl. 333-17.00M.

Advanced Micro Devices, Inc.: *See*—
Vasseghi, Nader; Goddard, Donald G.; and Eccles, Robert E., 4,678,940, Cl. 307-446.000.
Williams, Bertrand J., 4,678,944, Cl. 307-475.000.

AE PLC: *See*—
Philby, Jonathan D., 4,677,900, Cl. 92-212.000.

Aeroquip Corporation: *See*—
Smith, Donald E.; and Haunhorst, Greg A., 4,678,219, Cl. 294-82.330.

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Dresti, Silvano; Buhler, Ernst; and Derighetti, Rene, 4,678,885, Cl. 219-69.00C.

Agarwal, Anil K.; and Hay, Robert A., to Norton Company. Very smooth and flat polycrystalline alumina substrates from direct firing. 4,678,762, Cl. 501-127.000.

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Nickola, Richard A.; Sok, Brian A.; and Agarwal, Shashi B., 4,678,717, Cl. 428-553.000.

Agency of Industrial Science and Technology: *See*—
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Tsuji, Tomoji; and Wakui, Natsuko, 4,678,858, Cl. 568-902.000.
Sakuragi, Masako; and Ichimura, Kunihiro, 4,678,844, Cl. 525-417.000.
Sekiya, Tadashi; Tsuzuki, Akihiro; and Torii, Yasuyoshi, 4,678,732, Cl. 430-136.000.

Agnello, Joseph A., Jr.: *See*—
Kaye, Gordon E.; and Agnello, Joseph A., Jr., 4,677,782, Cl. 42-100.000.

Agoston, Agoston, to Tektronix, Inc. Equivalent time pseudorandom sampling system. 4,678,345, Cl. 368-119.000.

Ahlswede, Thomas E.: *See*—
Robinson, John S.; Ahlswede, Thomas E.; and Cornelius, Charles A., 4,679,153, Cl. 364-523.000.

Ahmad, Eddress; and Pack, Roger N. Footwear with pivotal toe. 4,677,769, Cl. 36-117.000.

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Archer, David H.; and Ahmed, M. Mushtaq, 4,677,829, Cl. 60-39.020.

Ahroni, Joseph M. Multiple-socket end connector for extension cords. 4,678,257, Cl. 439-426.000.

Aida Engineering, Ltd.: *See*—
Imanishi, Shozo; and Sato, Mitsuo, 4,677,908, Cl. 100-53.000.

Aigo, Seiichiro. Spin drier for semiconductor material. 4,677,758, Cl. 34-58.000.

Aimoto, Michiyuki: *See*—
Miyazaki, Hiroshi; Arika, Junji; and Aimoto, Michiyuki, 4,678,651, Cl. 423-329.000.

Air Products and Chemicals, Inc.: *See*—
Iacoviello, John G., 4,678,829, Cl. 524-459.000.
Shenoy, Thirthahalli A.; and Tao, John C., 4,677,827, Cl. 60-648.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibatani, Juichi, 4,678,064, Cl. 188-73.450.
Furusawa, Choji; and Ishiguro, Toshiaki, 4,677,879, Cl. 74-866.000.
Hasegawa, Masahiko; Naito, Yoshihiro; Tsunekawa, Masaru; and Momose, Yutaka, 4,677,824, Cl. 60-521.000.
Ishida, Keiichi; and Terada, Takami, 4,678,232, Cl. 297-408.000.
Sawatari, Takeo; Nakamura, Mitsutaka; and Sugiura, Toshihiro, 4,677,847, Cl. 73-64.000.

Ajamian, Hrant K. Annular cutting disc. 4,677,963, Cl. 125-15.000.

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Kobayashi, Osamu; Akagawa, Masaki; and Hayashi, Hiroshi, 4,678,072, Cl. 194-206.000.

Akahane, Shoji: *See*—
Kondo, Kenji; Katsuyama, Shigeru; Akahane, Shoji; and Tomioka, Kentaro, 4,678,436, Cl. 433-228.100.

Akashi, Goro: *See*—
Asai, Takamitsu; Akashi, Goro; Kitamoto, Tatsuji; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,678,682, Cl. 427-48.000.

Akashi, Toshihiro: *See*—
Shiratsuchi, Masami; Kawamura, Kiyoshi; Akashi, Toshihiro; Ishihama, Hiroshi; and Uchida, Yasumi, 4,678,803, Cl. 514-456.000.

Akhter, Lalarukh; Atkinson, Ronald E.; Wages, Dwight E.; and Beyer, Harold H., to Procter & Gamble Company, The. Liquid cleansing composition. 4,678,606, Cl. 252-542.000.

Akiyama, Kazunori; Tsunoda, Arihiro; and Tanaka, Satoshi, to Mita Industrial Co., Ltd. Sheet material conveying device. 4,678,178, Cl. 271-242.000.

Aktiebolaget SKF: *See*—
Hallerback, Stig L., 4,677,725, Cl. 29-280.000.

Aktiengesellschaft Brown, Boveri & Cie: *See*—
Jahnke, Bernd, 4,678,635, Cl. 420-449.000.

Akzo America Inc.: *See*—
Brady, Cathereine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, 4,678,580, Cl. 210-490.000.

Akzo NV: *See*—
Meijer, John, 4,678,817, Cl. 523-144.000.

Alain, Dini: *See*—
Barlet, Denis; and Alain, Dini, 4,678,503, Cl. 71-93.000.

Albrecht, Ernst: *See*—
Diener, Horst; Albrecht, Ernst; and Willenbacher, Erich, 4,677,924, Cl. 112-258.000.

Alcatel: *See*—
Petit, Andre , 4,678,259, Cl. 439-610.000.

Alderman, Daniel A.; and Wolford, Troy D., to Dow Chemical Company, The. Sustained release dosage form based on highly plasticized cellulose ether gels. 4,678,516, Cl. 106-197.100.

Alexander, Iosef; and Bar-on, Menachem, to Negev Phosphates Ltd. Process for the manufacture of monopotassium phosphate. 4,678,649, Cl. 423-308.000.

Alfred Teves GmbH: *See*—
Belart, Juan, 4,678,242, Cl. 303-92.000.

Allegheny Ludlum Corporation: *See*—
Johns, Robert H.; and Nauman, John D., 4,678,719, Cl. 428-593.000.

Allen, Charles M.: *See*—
Bingham, David; and Allen, Charles M., 4,679,134, Cl. 363-61.000.

Allen, Harvey G., to Westinghouse Electric Corp. Low net positive suction head pumps. 4,678,405, Cl. 417-245.000.

Allen, Hubert D.: *See*—
Barton, James W.; and Allen, Hubert D., 4,678,042, Cl. 172-15.000.
Allen, James A.: *See*—
Lancaster, Gerald M.; and Allen, James A., 4,678,713, Cl. 428-421.000.
McKinney, Osborne K.; Allen, James A.; and Flores, David P., 4,678,836, Cl. 525-221.000.
Allen, Peter, to Danby Pty. Ltd. Sewer renovation system. 4,678,370, Cl. 405-154.000.
Allen, Sammy G., to Sewalt, Ronny. Musical baby bottle. 4,678,093, Cl. 215-11.00R.
Allert, Kurt, to Kurt Allert GmbH & Co. KG. Hose clamp with tightener. 4,677,712, Cl. 24-274.00R.
Allied Corporation: *See*—
Gallusser, David O.; Brush, Robert W., Sr.; and MacAvoy, David W., 4,678,260, Cl. 439-607.000.
Kritchevsky, Gina R.; Gregor, John A.; Gruendig, Manfred W.; Sellers, Gregory J.; and Liss, Barbara, 4,678,699, Cl. 428-175.000.
Reichardt, Manfred; and Loss, Rolf D., 4,678,262, Cl. 439-857.000.
Alling, Richard L.; Shepard, Richard W.; Landrum, Clyde L.; Tofield, Robert H.; and Podhajecki, Stephen T., to Torrington Company, The. Method for making a double row roller bearing retainer. 4,677,720, Cl. 29-148.40C.
Allison, James A. Clay pigeon launcher. 4,677,961, Cl. 424-5.000.
Allstar Verbrauchsguter GmbH: *See*—
Schuster, Wilhelm, 4,677,705, Cl. 15-398.000.
Alltel Corporation: *See*—
Muehleisen, Thomas C., 4,679,226, Cl. 379-95.000.
Almblad, Donald: *See*—
Almblad, Robert, 4,677,835, Cl. 70-456.00R.
Almblad, Robert, to Almblad, Donald. Plastic card/key combination and hinge structure. 4,677,835, Cl. 70-456.00R.
Almeras, Roland: *See*—
Ollivier, Jean; and Almeras, Roland, 4,678,385, Cl. 411-456.000.
Almqvist, Christer, to Reheat AB. Plate heat exchanger. 4,678,030, Cl. 165-166.000.
Aloys F. Dornbracht GmbH & Co.: *See*—
Dornbracht, Helmut; and Grasse, Klaus-Peter, 4,678,207, Cl. 285-39.000.
Alpaiwalla, Feroz K.; and Begeman, Robert H., to RCA Corporation. Radio frequency switch. 4,678,929, Cl. 307-112.000.
Alps Electric Co., Ltd.: *See*—
Ohashi, Yoshihiro, 4,679,025, Cl. 338-197.000.
Okita, Masao; Gunji, Kunihiko; and Saito, Yukio, 4,679,106, Cl. 360-99.000.
Tashiro, Yoshizo, 4,678,284, Cl. 350-344.000.
Alshareedah, Ebrahaem. Forged spur gear with web connected teeth. 4,677,870, Cl. 74-431.000.
Alsthom: *See*—
Nicoloso, Dante, 4,678,877, Cl. 200-148.00F.
ALTA S.p.A.: *See*—
Riglietti, Antonio, 4,678,122, Cl. 239-333.000.
Aluminum Company of America: *See*—
Brown, Melvin H., 4,678,548, Cl. 204-67.000.
Hochbein, David E., 4,677,727, Cl. 29-402.060.
Knapp, David J.; and Waltz, Marion D., 4,678,023, Cl. 164-452.000.
LaBarge, Robert L.; and Maier, Frank E., 4,678,096, Cl. 220-273.000.
Ray, Siba P., 4,678,760, Cl. 501-96.000.
Sood, Ajay; and Marra, Robert A., 4,678,657, Cl. 423-600.000.
The, Paul J.; and Misra, Chanakya, 4,678,477, Cl. 23-305.00A.
ALZA Corporation: *See*—
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,678,467, Cl. 604-892.000.
AM International, Inc.: *See*—
Goodwin, Eber L., 4,677,912, Cl. 101-365.000.
Kiener, Michael A., 4,678,597, Cl. 252-100.000.
Amada Engineering Service Co., Inc.: *See*—
Koseki, Ryoji, 4,679,204, Cl. 372-107.000.
Amana Refrigeration, Inc.: *See*—
Pink, John J., 4,678,247, Cl. 312-116.000.
Amdahl Corporation: *See*—
Dewey, Loren G., 4,679,195, Cl. 371-29.000.
American Biltrite, Inc.: *See*—
Smith, Merrill M.; and Ferguson, Donald C., 4,678,528, Cl. 156-220.000.
American Cyanamid Company: *See*—
Brownrigg, Neville J., 4,678,585, Cl. 210-727.000.
Dugliss, Charles H., 4,678,608, Cl. 252-700.000.
American Greeting Corporation: *See*—
Nervig, Charles H.; and Dimmick, Vance E., 4,678,086, Cl. 211-47.000.
American Hospital Supply Corporation: *See*—
Nashef, Aws S.; and Campbell, Todd D., 4,678,470, Cl. 623-16.000.
American Motors Corporation: *See*—
Batchelor, Robert B., 4,677,875, Cl. 74-695.000.
American Sterilizer Company: *See*—
Sanders, Ward L.; and Robinson, David W., 4,678,171, Cl. 269-325.000.
American Telephone and Telegraph Company: *See*—
Olson, Jeffrey J.; Peck, Stephen R.; and Seaton, David P., 4,679,189, Cl. 370-60.000.
American Telephone and Telegraph Company AT&T Bell Laboratories: *See*—
Brooks, Kenneth L.; Bufkin, Paul R.; Mihal, David G.; and Miller, Jerry G., 4,679,232, Cl. 379-413.000.
Capasso, Federico; Cho, Alfred Y.; Hutchinson, Albert L.; and Mohammed, Khalid, 4,679,061, Cl. 357-4.000.
Jirka, Howard F., 4,679,132, Cl. 363-21.000.
Kirsch, Howard C.; and Procyk, Frank J., 4,679,172, Cl. 365-222.000.
Lea, Chin-Tau A., 4,679,186, Cl. 370-14.000.
American Telephone and Telegraph Company, AT&T Technologies: *See*—
Caruso, Robert D.; and Messina, Joseph A., 4,678,891, Cl. 219-121.0LJ.
American Telephone and Telegraph Company, AT&T Technologies, Inc.: *See*—
Anderson, Carl R.; and Seaman, Gary G., 4,678,073, Cl. 198-396.000.
Ameur, Hanafi. Arrangement for safety belt. 4,678,134, Cl. 242-107.40A.
Ammermann, Eberhard: *See*—
Rentzea, Costin; Sauter, Hubert; Karbach, Stefan; Will, Wolfgang; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,798, Cl. 514-383.000.
Schulz, Guenter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,504, Cl. 71-94.000.
Amoco Corporation: *See*—
Smith, Michael B., 4,678,037, Cl. 166-299.000.
Amon, Leopold: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
AMP Incorporated: *See*—
Bowen, Terry P.; Glover, Douglas W.; Hoover, Charles D.; Huber, John H.; and Schaffer, Ronald R., 4,678,264, Cl. 350-96.200.
Douty, George H.; and Landis, John M., 4,678,121, Cl. 439-610.000.
Farrar, John C.; Ney, Reuben E.; and Schroeder, James L., III, 4,679,013, Cl. 333-182.000.
Ampex Corporation: *See*—
Williams, Marshall; and Rodal, David R., 4,679,098, Cl. 360-10.100.
Analog Devices, Incorporated: *See*—
Holloway, Peter R., 4,678,936, Cl. 307-303.000.
Anderson, Andrew G.; Bullen, David A.; and Ferguson, Robert G., to Canadian Fram Limited. Accessory drive with band brake. 4,677,877, Cl. 74-785.000.
Anderson, Carl E.; and Killop, James T., to Anderson-Cook, Inc. Apparatus for flanging and splining a thin-walled power transmission member. 4,677,836, Cl. 72-88.000.
Anderson, Carl R.; and Seaman, Gary G., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Apparatus and methods for handling bulk arrays of articles. 4,678,073, Cl. 198-396.000.
Anderson, Charles R., to Nicolet Instrument Corporation. Double-pass optical interferometer. 4,678,333, Cl. 356-346.000.
Anderson-Cook, Inc.: *See*—
Anderson, Carl E.; and Killop, James T., 4,677,836, Cl. 72-88.000.
Anderson, David H. Intrusion indicating shield for consumer products. 4,678,083, Cl. 206-459.000.
Anderson, J. Dale; McMillen, Kenneth R.; and Goertz, Arnold E., to Hesston Corporation. Quick attach apparatus for crop harvest header and the like. 4,677,814, Cl. 56-15.600.
Anderson, Mark L.: *See*—
Ennis, James F., III, 4,678,107, Cl. 222-386.500.
Andersson, Bengt A., to Waco Jonsereds AB. Device in woodworking machines. 4,677,733, Cl. 29-563.000.
Andrea, Johan; Lubchenko, Eugene; and Bradley, Ralph H., to NAP Consumer Electronics Corp.; and U.S. Philips Corporation. Color picture projection system with a wavelength-selective reflector for filtering out undesired light from a monochrome picture display source. 4,679,069, Cl. 358-60.000.
Andreas Stihl: *See*—
Wieland, Dieter, 4,678,411, Cl. 417-500.000.
Angas, David J., to Karhu Titan Canada Limitee. Hockey glove having a flexible cuff. 4,677,698, Cl. 2-161.00A.
Anger, Bernd R.: *See*—
Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettgen, Herbert F., 4,678,747, Cl. 435-7.000.
Annegarn, Marcellinus J. J. C.: *See*—
Schmitz, Herman J. R.; Annegarn, Marcellinus J. J. C.; and Fekkes, Wilhelmus F., 4,679,083, Cl. 358-147.000.
Anscher, Joseph, to National Molding Corporation. Reversible buckle. 4,677,711, Cl. 24-200.000.
Anstey, Henry D.: *See*—
Verhulst, Michael J.; and Anstey, Henry D., 4,677,807, Cl. 53-118.000.
ANT Nachrichtentechnik GmbH: *See*—
Schomers, Josef; Erbele, Kurt; and Bonk, Wernfried, 4,679,121, Cl. 361-413.000.
Antek Instruments, Inc.: *See*—
Parks, Robert E., 4,678,756, Cl. 436-123.000.
Ao, Hideki; Obata, Minoru; and Inui, Jun, to Yoshitomi Pharmaceutical Industries, Ltd. Thiadiazine compounds. 4,678,785, Cl. 514-222.000.
AO Medical Products AB: *See*—
Ohlson, Carl-Eric; and Behnke, Gunther, 4,679,223, Cl. 378-195.000.
Aoki, Hisao: *See*—
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Aoki, Ryoichi: *See*—
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Aoyagi, Masaru; and Saitoh, Makoto, to NEC Corporation. Underwater communication system. 4,679,177, Cl. 367-132.000.
Aoyagi, Yoshiki: *See*—
Shinozaki, Masatoshi; Matsumoto, Yoshihiro; Aoyagi, Yoshiki; and Kojima, Kazuhisa, 4,678,707, Cl. 428-323.000.
Apothekernes Laboratorium A.S.: *See*—
Weibye, Bjarne, 4,677,907, Cl. 99-483.000.
Apotheloz, Robert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Safety device for a spinning projectile fuze. 4,677,914, Cl. 102-233.000.
Aprica Kassai Kabushikikaisha: *See*—
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Arai, Michio: *See*—
Kobayashi, Mikiya; Nakada, Takeshi; and Arai, Michio, 4,679,056, Cl. 346-76.0PH.
Arai, Nobushige, to Sharp Kabushiki Kaisha. Solar heat collector assembly. 4,677,966, Cl. 126-450.000.
Arai, Osamu: *See*—
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
Archer, David H.; and Ahmed, M. Mushtaq, to Westinghouse Electric Corp. Method for increasing the efficiency of gas turbine generator systems using low BTU gaseous fuels. 4,677,829, Cl. 60-39.020.
Arendale, William F.: *See*—
Craig, Preston S.; and Arendale, William F., 4,678,328, Cl. 356-141.000.
Arendt, Ronald H.: *See*—
Pasco, Wayne D.; and Arendt, Ronald H., 4,678,683, Cl. 427-123.000.
Arieh, Simon; and Courvoisier, Guy, to Lange International S.A. Ski boot. 4,677,771, Cl. 36-120.000.
Arika, Junji: *See*—
Miyazaki, Hiroshi; Arika, Junji; and Aimoto, Michiyuki, 4,678,651, Cl. 423-329.000.
Arioka, Hiroyuki: *See*—
Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, 4,678,708, Cl. 428-336.000.
Arizona Board of Regents: *See*—
Kuester, James L., 4,678,860, Cl. 585-14.000.
Arldt, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., to International Business Machines Corporation. Sheet money feeding machine with improved separation means. 4,678,175, Cl. 271-34.000.
Armstrong, Gregory J.: *See*—
Doering, Robert R.; Duane, Michael P.; and Armstrong, Gregory J., 4,677,739, Cl. 29-576.00B.
Arnould, Emmanuel; and Dugre, Jean-Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Inverse discrete cosine transform calculation processor. 4,679,163, Cl. 364-725.000.
Artz, Steven P., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,678,498, Cl. 71-87.000.
Asagi, Yasuyoshi: *See*—
Hattori, Toshihiro; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,677,880, Cl. 74-866.000.
Asahi Glass Company Ltd.: *See*—
Kida, Otojiro; and Segawa, Yutaka, 4,678,759, Cl. 501-92.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hidaka, Hiroyoshi; and Sone, Takanori, 4,678,783, Cl. 514-218.000.
Mitsui, Osamu; and Fukuoka, Yohei, 4,678,861, Cl. 585-266.000.
Shibasaki, Akio; and Iwasaki, Hirofumi, 4,678,703, Cl. 428-288.000.
Asai, Takamitsu; Akashi, Goro; Kitamoto, Tatsuji; Chikamasa, Hiroshi; and Sato, Tsunehiko, to Fuji Photo Film Co., Ltd. Process for producing magnetic recording medium. 4,678,682, Cl. 427-48.000.
Asai, Takamitsu: *See*—
Tokunaga, Fumihiro; Asai, Takamitsu; and Fujiyama, Masaaki, 4,678,706, Cl. 428-323.000.
Asakawa, Kenichi: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,678,371, Cl. 405-164.000.
Asano, Teruyoshi: *See*—
Bando, Yoshiaki; Asano, Teruyoshi; Kato, Shigenobu; and Tanioka, Katsuhiko, 4,678,161, Cl. 251-171.000.
Ashai Optical Co., Ltd.: *See*—
Hara, Masato; and Kaneko, Atsumi, 4,678,910, Cl. 250-237.00G.
Ashelin, Charles J.: *See*—
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Ashida, Kiyomi: *See*—
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Ashland Oil, Inc.: *See*—
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Assche, Jan V.: *See*—
Bagaglio, Giancarlo; Assche, Jan V.; and Watts, Arun, 4,678,513, Cl. 106-38.220.
Associated Press, The: *See*—
Rutherford, David G.; Regnault, Alain; and Kirlick, John, 4,679,094, Cl. 358-261.000.
AT&T Information Systems, Inc.: *See*—
Olson, Jeffrey J.; Peck, Stephen R.; and Seaton, David P., 4,679,189, Cl. 370-60.000.
Atkins, Kenneth E.; Gandy, Raymond C.; and Larck, William A., to Union Carbide Corporation. Process for promoting the adhesion of epoxy bonded fiber reinforced plastics. 4,678,711, Cl. 428-414.000.
Atkinson, Ronald E.: *See*—
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Atlantic Richfield Company: *See*—
Killough, John E., 4,678,033, Cl. 166-246.000.
Mancinelli, Paul A., 4,678,837, Cl. 525-250.000.
Mazurek, Harry, 4,678,862, Cl. 585-500.000.
Auchter, Matthias J. Manual measuring tool for rolls of material. 4,677,752, Cl. 33-128.000.
Aucktor, Erich; and Gartner, Gunter, to Lohr & Bromkamp GmbH. Constant velocity ratio universal joint. 4,678,453, Cl. 464-144.000.
Austoft Industries Limited: *See*—
Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., 4,677,813, Cl. 56-13.900.
Automotive Products plc: *See*—
Ball, Robert J.; and Maycock, Ian C., 4,678,071, Cl. 192-70.270.
Autosense Corporation: *See*—
Elfman, Brian P.; and Zajac, Patricia L., 4,678,057, Cl. 180-272.000.
Avejic, Katarina, to Dunromin Enterprises Unlimited, Inc. Sanitary pad. 4,678,465, Cl. 604-397.000.
Avery International: *See*—
Slobodkin, Yefim, 4,678,457, Cl. 493-355.000.
Avison, Malcolm J.; Hetherington, Hoby P.; Jue, Thomas H.; and Rothman, Douglas L., to Yale University. Apparatus and method for determining the presence of substances in a sample by NMR and producing an NMR image thereof. 4,678,995, Cl. 324-309.000.
Avl Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbH: *See*—
Mang, Hermenegild; and Engel, Gunter, 4,678,535, Cl. 156-623.00R.
Awamura Metal Industry Co., Ltd.: *See*—
Yasuoka, Junichi; Kamiyama, Sumio; Ashida, Kiyomi; and Hata, Ryozo, 4,678,511, Cl. 75-251.000.
Awata, Yutaka: *See*—
Fukuda, Misao; Tsuda, Toshitaka; Murano, Kazuo; and Awata, Yutaka, 4,679,188, Cl. 370-29.000.
Axegård, Peter A.: *See*—
Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Axegård, Peter A., 4,678,654, Cl. 423-478.000.
Ayoub, Joseph; and Bourdet, Dominique, to Schlumberger Technology Corporation. Hydrocarbon well test method. 4,677,849, Cl. 73-155.000.
Ayres, Walter D., Jr., to Surgeaco, Inc. Removable in-line self-cleaning strainer for piping systems. 4,678,589, Cl. 210-797.000.
Ayukawa, Nobuhiro; and Konishi, Yasuhiko, to Nippon Dacro Shamrock Co., Ltd. Non-aqueous degreasing and chromating solution for metal treatment. 4,678,518, Cl. 148-6.200.
Azaz, Emma: *See*—
Segal, Ruth; Pisanty, Sara; and Azaz, Emma, 4,678,772, Cl. 514-25.000.
B. F. Goodrich Company, The: *See*—
Eroskey, Richard E.; and Miller, Larry G., 4,678,530, Cl. 156-245.000.
Kramer, James H., 4,677,721, Cl. 29-149.50S.
Baba, Takeshi; and Suda, Shigeyuki, to Canon Kabushiki Kaisha. Afocal variable magnification optical system. 4,678,899, Cl. 230-201.000.
Babcock, Lowell C. Salt block carrier. 4,678,218, Cl. 294-16.000.
Babcock & Wilcox Company, The: *See*—
King, Raymond A.; Larson, Jeffrey G.; and Walton, Lewis A., 4,678,630, Cl. 376-438.000.
Babel, Werner, to MAHO Werkzeugmaschinenbau Babel & Co. Safety hood for palette change-over devices of machine tools. 4,677,718, Cl. 29-33.00P.
Back, Gerhard; Schutz, Hans U.; and Schlesinger, Ulrich, to Ciba-Geigy Corporation. Metal dye complexes containing an azo or azomethine dye and a colorless ligand with the C═N—N═C group. 4,678,851, Cl. 534-619.000.
Bacon, Chester A., Jr.: *See*—
Tung, Chi F.; and Bacon, Chester A., Jr., 4,678,695, Cl. 428-120.000.
Badger, Edward W.: *See*—
Taylor, Michael D.; and Badger, Edward W., 4,678,796, Cl. 514-356.000.
Bagaglio, Giancarlo; Assche, Jan V.; and Watts, Arun, to Imperial Chemical Industries plc. Polyol compositions containing mould release agent. 4,678,513, Cl. 106-38.220.
Baggiani, Giuseppe. Transformable low drawing-room table. 4,677,919, Cl. 108-63.000.
Bahl, Inder J., to ITT Gallium Arsenide Technology Center, a division of ITT Corporation. Microwave circulator comprising a plurality of directional couplers connected together by isolation amplifiers. 4,679,010, Cl. 333-109.000.
Bailey, Earl D. Portable machining turntable. 4,678,381, Cl. 409-221.000.
Baker, Malcolm J.: *See*—
Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., 4,677,813, Cl. 56-13.900.

Baker, William R.; Marulic, Walter J.; and Robertson, James C., to Thrall Car Manufacturing Company. Railroad car with retractable closure track held down by bridge plate. 4,677,918, Cl. 105-378.000.

Bakow, Leon: *See—*
Sparling, Kenneth P.; Richardson, David G.; Incardona, Angelo; Wood, Ronald E.; Kikendall, Garth D.; and Bakow, Leon, 4,678,384, Cl. 411-43.000.

Baldwin, John J.; Halczenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., to Merck & Co., Inc. Prodrugs of antihypercholesterolemic compounds. 4,678,806, Cl. 514-539.000.

Ball Corporation: *See—*
Wood, Charles L., 4,679,148, Cl. 364-473.000.

Ball, Robert J.; and Maycock, Ian C., to Automotive Products plc. Diaphragm spring clutch cover assembly. 4,678,071, Cl. 192-70.270.

Ballhause, Helmut: *See—*
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.

Balsells, Joan C.: *See—*
Balsells, Peter J., 4,678,210, Cl. 285-318.000.

Balsells, Peter J., to Balsells, Peter J.; and Balsells, Joan C. Loading and locking mechanism. 4,678,210, Cl. 285-318.000.

Ban, Keisuke; and Daimaru, Akimasa, to Honda Giken Kogyo Kabushiki Kaisha. Fiber-reinforced piston for internal combustion engines and associated method of construction. 4,677,901, Cl. 92-213.000.

Ban, Thomas R.; Dusterhoft, Ernest E.; and Gilmore, John E., to Tricon Industries. Material spreader. 4,678,365, Cl. 404-118.000.

Bando, Yoshiaki; Asano, Teruyoshi; Kato, Shigenobu; and Tanioka, Katsuhiko, to Seikisui Kagaku Kogyo Kabushiki Kaisha. Ball valve. 4,678,161, Cl. 251-171.000.

Bania, Paul J., to Titanium Metals Corporation of America (TIMET). Production of titanium articles that are free from low density inclusions. 4,678,506, Cl. 75-10.250.

Bankers Trust Co.: *See—*
Bullock, Joseph J., 4,678,094, Cl. 215-256.000.

Bantz, David F.; Malaby, Davey L.; and Sholtz, Paul N., to International Business Machines Corporation. Band buffer display system. 4,679,038, Cl. 340-721.000.

Bar-on, Menachem: *See—*
Alexander, Iosef; and Bar-on, Menachem, 4,678,649, Cl. 423-308.000.

Barabe, David J. Waist band adjustment for garment. 4,677,699, Cl. 2-221.000.

Bard, Martin. Wall, ceiling and/or floor formation and a method for producing it. 4,677,801, Cl. 52-389.000.

Bardsley, Ian R.: *See—*
Lipski, Jerzy A.; and Bardsley, Ian R., 4,678,907, Cl. 250-231.0SE.

Barker, James M.: *See—*
Luke, Robert R.; Barker, James M.; Smith, Michael L.; Grigar, Larry L.; and Miller, Carl B., 4,678,044, Cl. 175-4.520.

Barlet, Denis; and Alain, Dini, to Rhone-Poulenc Agrochimie. Concentrated aqueous suspensions based on neburon. 4,678,503, Cl. 71-93.000.

Barmag AG: *See—*
Wessolowski, Bernd; and Mink, Wilfried, 4,677,860, Cl. 73-862.480.

Barnes, John R.; Diamond, John E.; and Griffin, Graham J., to Conoco Inc. Clamps for attaching pipelines together in parallel relationship. 4,678,147, Cl. 248-74.100.

Barnett, Earl D.; and Mundstock, Robert W., to Chicago Show Printing Co. Collapsible container. 4,678,095, Cl. 220-4.00F.

Barnett, Ronald E.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,678,674, Cl. 426-548.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,678,675, Cl. 426-548.000.

Barrett, Ronnie G. Anti-armor gun. 4,677,897, Cl. 89-166.000.

Barron, Michael H.: *See—*
Gutschick, Vincent P.; Barron, Michael H.; Waechter, David A.; and Wolf, Michael A., 4,678,330, Cl. 356-222.000.

Barthelemy, Louis. Electric transformer with selectively energized modular circuits. 4,678,986, Cl. 323-343.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Force recording seat belt assembly. 4,677,861, Cl. 73-862.540.

Bartlett, Ian G.; and Lymer, Donald A., to Tybar Engineering Pyt. Ltd. Apparatus for tufting yarn bits. 4,678,533, Cl. 156-435.000.

Barton, James W.; and Allen, Hubert D., to Tamer Corporation. Method and apparatus for cutting an athletic field line. 4,678,042, Cl. 172-15.000.

BASF Aktiengesellschaft: *See—*
Rentzea, Costin; Sauter, Hubert; Karbach, Stefan; Will, Wolfgang; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,798, Cl. 514-383.000.
Schoettle, Klaus, 4,678,140, Cl. 242-199.000.
Schoettle, Klaus; Schmidts, Kurt; Kamm, Eugen; and Berger, Heinz, 4,679,110, Cl. 360-132.000.
Schulz, Guenter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,504, Cl. 71-94.000.

BASF Corporation: *See—*
Schmolka, Irving R., 4,678,664, Cl. 424-65.000.

Bashford, Dennis J.; and Blackham, Geoffrey H., to Rediffusion Simulation Limited. Field blanking pulse modifier. 4,679,080, Cl. 358-150.000.

Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., to Fieldcrest Cannon, Inc. Apparatus for automatically and continuously feeding and folding textile articles. 4,678,173, Cl. 270-45.000.

Bass, Ronald M.: *See—*
Eastlund, Bernard J.; Schmitt, Kenneth J.; and Bass, Ronald M., 4,678,034, Cl. 166-248.000.

Batchelor, Robert B., to American Motors Corporation. Transfer case for multiple drive axle vehicle. 4,677,875, Cl. 74-695.000.

Bateman, Andrew: *See—*
McGeehan, Joseph P.; and Bateman, Andrew, 4,679,243, Cl. 455-47.000.

Bateman, Terence; and Stevens, William W., to Stanton and Staveley Limited. Joints formed with welded flange pipes. 4,678,211, Cl. 285-368.000.

Battin, Leland B., Jr.: *See—*
Rehbein, Clayton J.; and Battin, Leland B., Jr., 4,678,215, Cl. 292-247.000.

Battu, Ramgopal: *See—*
Wevers, William E.; Krause, James N.; and Battu, Ramgopal, 4,679,102, Cl. 360-75.000.

Bauck, Jerald L., to Motorola Inc. Feature extractor for quasi-periodic signals. 4,678,987, Cl. 324-77.00R.

Bauer, Rainer. Circuit for the actuation of liquid crystal layers in mirrors. 4,678,281, Cl. 350-331.00R.

Baxter Travenol Laboratories, Inc.: *See—*
Cotter, Richard; Johnson, Robert C.; Rowe, W. Bruce; and Young, Susan K., 4,678,807, Cl. 514-552.000.
Perry, Matthew J., 4,678,331, Cl. 356-246.000.
Shafer, John C., 4,678,894, Cl. 235-375.000.
Ward, Michael V.; and Cotter, Richard, 4,678,808, Cl. 514-560.000.

Bayer Aktiengesellschaft: *See—*
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.
Kruger, Bernd-Wieland; Hoffmann, Hellmut; Roos, Ernst; and Behrenz, Wolfgang, 4,678,777, Cl. 514-110.000.
Maurer, Fritz; Homeyer, Bernard; and Stendel, Wilhelm, 4,678,776, Cl. 514-89.000.

BBC Aktiengesellschaft Brown, Boveri & Cie.: *See—*
Westbrock, Paul; and Peitz, Theo, 4,678,876, Cl. 200-148.00R.

BCIRA: *See—*
Hayes, Peter R., 4,678,020, Cl. 164-16.000.

Beach, David E., to Eastman Kodak Company. Apparatus and method for identifying a film cartridge used in a particular type camera. 4,678,300, Cl. 354-21.000.

Bearden, Francis H.: *See—*
Haacke, E. Mark; and Bearden, Francis H., 4,678,996, Cl. 324-309.000.

Bearden, John L.: *See—*
Vandevier, Joseph E.; Bearden, John L.; Pranger, William F.; and Miller, Harold L., 4,678,399, Cl. 415-199.200.

Beaulieu, Andre R., to RCA Corporation. Apparatus for aligning a fiber and a device. 4,678,271, Cl. 350-96.200.

Beck, Ernst; Lenard, Peter; and Hutzel, Hans, to Vollmer Werke Maschinenfabrik GmbH. Feeding means for intermittently rotating a circular saw blade of great pitch. 4,677,882, Cl. 76-77.000.

Becker, Benedikt: *See—*
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.

Becker, Michael: *See—*
Hempel, Hans D.; Horn, Jurgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ullrich, 4,678,753, Cl. 435-296.000.

Beckman Instruments, Inc.: *See—*
Horrocks, Donald L.; and Kampf, Richard S., 4,678,912, Cl. 250-328.000.

Becton, Dickinson and Company: *See—*
Burns, James A., 4,677,979, Cl. 128-314.000.
Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., 4,678,752, Cl. 435-291.000.

Beecham Group p.l.c.: *See—*
Ponsford, Roger J.; Pearson, Michael J.; and Finch, Stephen C., 4,678,782, Cl. 514-210.000.
Ryder, Geoffrey A., 4,678,102, Cl. 222-181.000.

Beecher, John, III: *See—*
Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, 4,677,964, Cl. 126-41.00R.

Beeck, Peter op de; Wuest, Rainer; and Stelter, Norbert, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Method and apparatus for controlling a clutch-transmission unit. 4,679,145, Cl. 364-424.100.

Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., to Devon County Council. Waste transfer packers. 4,677,909, Cl. 100-229.000.

Begeman, Robert H.: *See—*
Alpaiwalla, Feroz K.; and Begeman, Robert H., 4,678,929, Cl. 307-112.000.

Behnke, Gunther: *See—*
Ohlson, Carl-Eric; and Behnke, Gunther, 4,679,223, Cl. 378-195.000.

Behrenz, Wolfgang: *See—*
Kruger, Bernd-Wieland; Hoffmann, Hellmut; Roos, Ernst; and Behrenz, Wolfgang, 4,678,777, Cl. 514-110.000.

BEI Electronics, Inc.: *See—*
LaPlante, Dale, 4,678,908, Cl. 250-231.0SE.

Beichel, Rudi: *See*—
Rivas, Nelson; and Beichel, Rudi, 4,678,039, Cl. 166-303.000.

Beier, Helmut, to Siemens Aktiengesellschaft. Gas pressure circuit breaker. 4,678,878, Cl. 200-148.00A.

Beitinger, Eberhard; and Glaser, Eberhard, to Ed. Zublin Aktiengesellschaft. Adsorption layer. 4,678,771, Cl. 502-402.000.

Belart, Juan, to Alfred Teves GmbH. Hydraulic vehicle brake system with anti-locking. 4,678,242, Cl. 303-92.000.

Belke, Robert E., Jr.; Shirk, Raymond A.; Lin, Hsiu H.; and Zakraysek, Louis, to General Electric Company. Metal core printed circuit board. 4,679,122, Cl. 361-414.000.

Belluteau, Jean-Pierre; Bocard, Christian; Such, Christian; and Vaillant, Daniel, to Institut Francais du Petrole; and Laboratoire Central des Ponts et Chausses. Method usable in particular for washing and desorbing solid products containing hydrocarbons. 4,678,558, Cl. 208-390.000.

Belmares-Sarabia, Armand; and Chayka, Stanley J., to Corporate Communications Consultants, Inc. Color correction system and method with localized color sampling. 4,679,067, Cl. 358-29.000.

Benaroya, Henry. Multi-tandem free piston machine. 4,678,407, Cl. 417-341.000.

Benn, Pauline: *See*—
Corrie, Brian L.; Benn, Pauline; and McElevey, Michael J., 4,677,737, Cl. 29-571.000.

Benoit, Louis; Mabboux, Michel; Nerrinck, Bernard; and De Marchi, Jean-Louis, to Salomon S.A. Rear entry ski boot. 4,677,768, Cl. 36-117.000.

Bensahel, Daniel: *See*—
Haond, Michel; Bensahel, Daniel; and Dutartre, Didier, 4,678,538, Cl. 156-643.000.

Berg, Peter G.: *See*—
Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W., 4,678,982, Cl. 322-8.000.

Berg, Ralph T., to Honeywell Inc. Ring laser gyro block stiffener. 4,678,335, Cl. 356-350.000.

Berger, Heinz: *See*—
Schoettle, Klaus; Schmidts, Kurt; Kamm, Eugen; and Berger, Heinz, 4,679,110, Cl. 360-132.000.

Berger, Michael F.; and Sawyer, Sammy D., to Tandy Corporation. Co-processor combination. 4,679,166, Cl. 364-900.000.

Bergman, Jan, to Hollandse Signaalapparaten B.V. Pulse radar apparatus. 4,679,050, Cl. 342-196.000.

Bergner, Arndt, to Hilti Aktiengesellschaft. Expansion anchor assembly. 4,678,383, Cl. 411-32.000.

Bergvall, Bengt A., to Husqvarna Aktiebolag. Electronic fancy sewing machine having means for adjusting the driving means of a cloth feeder during a feeding phase. 4,677,927, Cl. 112-455.000.

Bernardi, Richard T.: *See*—
O'Brien, Thomas P.; and Bernardi, Richard T., 4,679,221, Cl. 378-148.000.

Berndt, Klaus-Gunther: *See*—
Preuss, Bernhard; and Berndt, Klaus-Gunther, 4,678,873, Cl. 200-18.000.

Bernier, Richard E.: *See*—
Ciarcia, Ronald D.; DiVincenzo, Gregory T.; Bernier, Richard E.; and Nagy, Joseph G., 4,679,016, Cl. 335-132.000.

Berova, Nikolina D.: *See*—
Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.

Berrios, Luis H.: *See*—
Ditsch, John R.; Williams, Theodore G.; and Berrios, Luis H., 4,678,181, Cl. 272-68.000.

Berschauer, Friedrich: *See*—
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.

Bertelsen, John C., to Bertelsen, John C. Filtering system for paper handling machines. 4,678,489, Cl. 55-418.000.

Bertolotti, Franco, to Montedison S.p.A. Die for hot die face cutting thermoplastic polymers. 4,678,423, Cl. 425-311.000.

Bertorello, Mario, to Rotomors S.p.A. System for controlling the jaws of a self-centering platform (pallet) which can be moved between fittings (pallet supports) carried by the loading and unloading station and the working station of a machine tool. 4,678,077, Cl. 198-803.010.

Bertot, Maurice: *See*—
Rudi, Alain; and Bertot, Maurice, 4,678,906, Cl. 250-227.000.

Bessey, Guy; and Bimbert, Claude, to CLECIM. Installation for preparing metal billets for extrusion. 4,677,838, Cl. 72-254.000.

Beta Raven Inc.: *See*—
Volk, Joseph A., Jr.; and Kniepmann, Mark R., 4,678,424, Cl. 425-331.000.

Bethmann, Karl W.: *See*—
Boecker, Juegen; Gersbach, Klaus; and Bethmann, Karl W., 4,677,915, Cl. 102-517.000.

Betterton, Joseph T.; and Glover, Alfred H., to Chrysler Motors Corporation. Shaft retainer. 4,678,362, Cl. 403-373.000.

Beyer, Harold H.: *See*—
Akhter, Lalarukh; Atkinson, Ronald E.; Wages, Dwight E.; and Beyer, Harold H., 4,678,606, Cl. 252-542.000.

Bicknell, John; and O'Brien, Stephen, to Bonar Bray Limited. Motor monitor signal analysis system. 4,678,990, Cl. 324-158.0MG.

Bielefelder Kuchenmaschinen-und Transportgeratefabrik vom Braucke GmbH: *See*—
vom Braucke, Hans; vom Braucke, Manfred; and Westerwelle, Dieter, 4,678,043, Cl. 172-349.000.

Biggs, Richard H.: *See*—
Dartey, Clemence K.; and Biggs, Richard H., 4,678,672, Cl. 426-19.000.

Bimbert, Claude: *See*—
Bessey, Guy; and Bimbert, Claude, 4,677,838, Cl. 72-254.000.

Bind-O-Matic AB: *See*—
Wiholm, Sture H., 4,678,386, Cl. 412-8.000.

Bingham, David; and Allen, Charles M., to Maxim Integrated Products, Inc. Integrated dual charge pump power supply and RS-232 transmitter/receiver. 4,679,134, Cl. 363-61.000.

Bio-Medical Co., Ltd.: *See*—
Hiroyoshi, Toshiki, 4,678,468, Cl. 623-1.000.

Biotest-Serum-Institut GmbH: *See*—
Hempel, Hans D.; Horn, Jurgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ullrich, 4,678,753, Cl. 435-296.000.

Bisaiji, Takashi, to Ricoh Company, Ltd. Image forming apparatus. 4,678,318, Cl. 355-15.000.

Bjorkman, Harry K., Jr.; and Carr, Peter, to Energy Development Associates, Inc. Formation of dense chlorine hydrate. 4,678,656, Cl. 423-500.000.

Black, Charles E., III; and Halstead, Raymond T., to Indak Manufacturing Corp. Electrical switch having flexible printed circuit connector cable. 4,678,249, Cl. 439-77.000.

Blackham, Geoffrey H.: *See*—
Bashford, Dennis J.; and Blackham, Geoffrey H., 4,679,080, Cl. 358-150.000.

Blanchard, Eugene J.: *See*—
Vigo, Tyrone L.; and Blanchard, Eugene J., 4,678,473, Cl. 8-480.000.

Blandford, David M.; and Easter, John H. Rotatable reciprocating collar for borehole casing. 4,678,031, Cl. 166-242.000.

Blanford, Denis M., to NCR Corporation. Scanning control system for merchandise checkout. 4,679,154, Cl. 364-525.000.

Blanken, Pieter G.; and van der Zee, Pieter, to U.S. Philips Corporation. Reduced distortion display circuit. 4,679,092, Cl. 358-242.000.

Blaupunkt-Werke GmbH: *See*—
Knakowski, Rolf; and Fahlbusch, Dieter, 4,679,026, Cl. 340-63.000.
Markovic, A.; Temerinac, M.; and Braegas, Peter, 4,679,238, Cl. 381-16.000.

Bletschacher, Max: *See*—
Duerrschnabel, Wolfgang; Puckert, Franz; Stueer, Heinrich; and Bletschacher, Max, 4,678,637, Cl. 420-490.000.

Bliznak, Bedrich V. Smoking apparatus having convoluted filtering-/heat-reduction passageway. 4,677,992, Cl. 131-209.000.

Bloch, Joseph T.; and Cross, Dan A., to Boeing Company, The. Robotic wire harness assembly system. 4,677,734, Cl. 29-564.200.

Blohm & Voss AG: *See*—
Schlichthorst, Norbert, 4,678,439, Cl. 440-11.000.

Blom, C. James, to Roxor Corporation. Method of constructing a segmented mirror. 4,678,280, Cl. 350-320.000.

Blood, Peter, to U.S. Philips Corporation. Optical absorption spectroscopy for semiconductors. 4,678,989, Cl. 324-158.00D.

Bobrovniczky, Bert: *See*—
Maddock, William H.; and Bobrovniczky, Bert, 4,678,153, Cl. 248-229.000.

Bocard, Christian: *See*—
Belluteau, Jean-Pierre; Bocard, Christian; Such, Christian; and Vaillant, Daniel, 4,678,558, Cl. 208-390.000.

Bock Products: *See*—
Weber, Charles A., 4,678,011, Cl. 138-96.00R.

Bode, Albert: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, 4,678,476, Cl. 8-639.000.

Boecker, Juegen; Gersbach, Klaus; and Bethmann, Karl W., to Rheinmetall GmbH. Armor-piercing projectile. 4,677,915, Cl. 102-517.000.

Boeing Company, The: *See*—
Bloch, Joseph T.; and Cross, Dan A., 4,677,734, Cl. 29-564.200.
Burlingame, Harry H., 4,678,977, Cl. 318-601.000.
Butcher, William T.; Furlong, James J.; Howe, Dwayne E.; Snell, Gerald T.; and Yara, Calvin M., 4,679,117, Cl. 361-181.000.
Jensen, Tom M.; Yoshimura, Frederick T.; and Jensen, Deborah P., 4,678,202, Cl. 280-642.000.

Boer, Willem D.; and Kawasaki, Atsushi, to Energy Conversion Devices, Inc. Self-alignment process for thin film diode array fabrication. 4,678,542, Cl. 156-659.100.

Boese, Roland, to Nicolet Instrument Corporation. Sample holder for powder x-ray diffractometer. 4,678,340, Cl. 366-111.000.

Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., to James River-Norwalk. Packaging container for microwave popcorn popping. 4,678,882, Cl. 219-10.55E.

Boivin, Daniel W.; and Zelonka, Ronald A., to Du Pont Canada Inc. Blends of polyolefins with polymers containing reactive agents. 4,678,834, Cl. 525-74.000.

Boll, Wolf: *See*—
Steinkamper, Reinhard; Boll, Wolf; and Peitsmeier, Karl, 4,678,361, Cl. 403-359.000.

Bollin, Ernest, Jr.; and Fletcher, Mark G., to Du Pont de Nemours, E. I., and Company. Trehalose as stabilizer and tableting excipient. 4,678,812, Cl. 514-777.000.

Bolton, Wilbur M.: *See*—
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., 4,678,028, Cl. 165-72.000.

Bolzan, Louis F.; and Weil, Edward D., to Stauffer Chemical Company. Process for the production of arylsulfonyl halides. 4,678,612, Cl. 260-543.00R.

Bomed Medical Manufacturing, Ltd.: *See*—
Sramek, Bohumir, 4,677,984, Cl. 128-681.000.

Bonar Bray Limited: *See*—
Bicknell, John; and O'Brien, Stephen, 4,678,990, Cl. 324-158.0MG.

Bonerb, Timothy C., to Bonerb, Vincent C. Freight vehicle with a convertible cargo space. 4,678,389, Cl. 414-267.000.

Bonerb, Vincent C.: *See*—
Bonerb, Timothy C., 4,678,389, Cl. 414-267.000.

Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., to Eaton Corporation. Electrical device with protective shroud for flexible electrical cable extending therefrom. 4,678,867, Cl. 174-135.000.

Bonk, Wernfried: *See*—
Schomers, Josef; Erbele, Kurt; and Bonk, Wernfried, 4,679,121, Cl. 361-413.000.

Bonneton, Marc; and Janvier, Dominique, to Societe Anonyme REDOUTE CATALOGUE. Automated self-powered material handling truck. 4,678,390, Cl. 414-282.000.

Book, Marshall K.: *See*—
Green, Carlos J.; Hirsius, John L.; and Book, Marshall K., 4,677,970, Cl. 128-82.100.

Book, William J.; Scott, Julian C.; and Grace, James A., to Westinghouse Electric Corp. Electrical distribution apparatus having drawout surge arrester. 4,679,113, Cl. 361-40.000.

Boos, Margareta: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, 4,678,476, Cl. 8-639.000.

Booth, David E.; Smith, Steven G.; and Adams, John L., to RCA Corporation. Kinescope funnel thumper and flush device. 4,678,448, Cl. 445-60.000.

Booth, Inc.: *See*—
Pritchett, James D., 4,678,104, Cl. 222-146.600.

Boots, Robert T., to Vermeulen-Hollandia Octrooien II B.V. Sliding roof for a vehicle. 4,678,228, Cl. 296-216.000.

Bouchard, Andre C.; Thibault, Paul A.; and Lagushenko, Radomir I., to GTE Products Corporation. Electrical lead-ins for use for arc sustaining atmospheres. 4,678,520, Cl. 148-6.350.

Bouchard, Antoine J. Dispenser for particulate matter. 4,678,377, Cl. 406-139.000.

Bourassa, Ronald R.; and Butler, Douglas B., to Inmos Corporation. Resistor with low thermal activation energy. 4,679,170, Cl. 365-154.000.

Bourdet, Dominique: *See*—
Ayoub, Joseph; and Bourdet, Dominique, 4,677,849, Cl. 73-155.000.

Bousquet, Beaumont. Clamped, readily-removable oil pan without drain hole. 4,677,947, Cl. 123-195.00C.

Bowen, Terry P.; Glover, Douglas W.; Hoover, Charles D.; Huber, John H.; and Schaffer, Ronald R., to AMP Incorporated. Electrical and fiber optic connector assembly. 4,678,264, Cl. 350-96.200.

Bowers, Cecil W.: *See*—
Cadwell, George H., Jr.; Pittman, Clarence B.; and Bowers, Cecil W., 4,678,487, Cl. 55-385.00A.

Bowers, George W., Jr.: *See*—
Gabor, Andrew; Dunfield, John C.; Bowers, George W., Jr.; and Crystal, Richard G., 4,678,355, Cl. 400-389.000.

Bowker, Thomas K. Rope descending device. 4,678,059, Cl. 182-5.000.

Bowman, John H., Jr. Overhead conveyor cleaning apparatus. 4,678,075, Cl. 198-496.000.

Bowyer, William H.; Crocker, Robert L.; Hansford, Christopher M.; Parker, Leslie K.; and Gray, Nigel, to Viragate Limited. Target apparatus including transmitting/receiving dart. 4,678,194, Cl. 273-373.000.

Bracht, Jeffrey L.; Heinrich, Martin W.; van Maaren, Richard D.; and Sleder, Richard L., to Kohler Co. Cooling system for a compact generator. 4,677,940, Cl. 123-2.000.

Bradford, Michael P.; and Maciolek, Joseph R., to United Technologies Corporation. Rotor control system. 4,678,401, Cl. 416-32.000.

Bradley, Ralph H.: *See*—
Andrea, Johan; Lubchenko, Eugene; and Bradley, Ralph H., 4,679,069, Cl. 358-60.000.

Brady, Cathereine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, to Akzo America Inc. Hydrolysis of fats. 4,678,580, Cl. 210-490.000.

Braegas, Peter: *See*—
Markovic, A.; Temerinac, M.; and Braegas, Peter, 4,679,238, Cl. 381-16.000.

Braillon & Cie (Societe Anonyme): *See*—
Braillon, Philibert M., 4,679,021, Cl. 335-295.000.

Braillon, Philibert M., to Braillon & Cie (Societe Anonyme). Magnetic retention plate with permanent magnets. 4,679,021, Cl. 335-295.000.

Bramel, Michael D.: *See*—
Metzger, David B.; Johnson, Glenn S.; and Bramel, Michael D., 4,678,531, Cl. 156-250.000.

Brandsetter, Robert W.; Schwarz, Jakob; and Seidon, Arnold, to Grumman Aerospace Corporation. Adaptive spread spectrum radar. 4,679,048, Cl. 342-61.000.

Brasuell, Larry R.; and Olson, Clayton E. Locking apparatus. 4,678,213, Cl. 292-37.000.

Braun Aktiengesellschaft: *See*—
Kullen, Albrecht, 4,678,410, Cl. 417-423.00R.

Brazenor, William J.: *See*—
Cannon, Stuart R.; Brazenor, William J.; Kneen, Peter W.; and Mullen, John L., 4,677,999, Cl. 135-117.000.

Brend, Ramon H. J.: *See*—
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.

Brent, Richard J.: *See*—
Moss, Brian F.; Brent, Richard J.; and Pilkington, Ian B., 4,678,307, Cl. 354-313.000.
Moss, Brian F.; and Brent, Richard J., 4,678,308, Cl. 354-313.000.
Moss, Brian F.; and Brent, Richard J., 4,678,309, Cl. 354-313.000.

Breukelman, Stephen P.: *See*—
Roe, Anthony M.; Coates, William J.; Slater, Robert A.; Breukelman, Stephen P.; and Meakins, George D., 4,678,786, Cl. 514-247.000.

Brew, Allan T.: *See*—
McAloon, Kevin T.; and Brew, Allan T., 4,678,700, Cl. 428-198.000.

Bridges, Stuart A.; and Goddard, John, to Rolls-Royce plc. Brush seals. 4,678,113, Cl. 228-160.000.

Bridgestone Co., Ltd.: *See*—
Furuta, Mitsuo; and Uchida, Shinji, 4,678,244, Cl. 305-57.000.

Bridgestone Corporation: *See*—
Sato, Susumu; and Okamoto, Keizo, 4,678,830, Cl. 524-495.000.

Bridoux, Michel: *See*—
Delhaye, Michel; Deffontaine, Andre ; Chapput, Andre ; Bridoux, Michel; and Da Silva, Edouard, 4,678,277, Cl. 356-301.000.

Brisebarre, Marcel, to Monec S.A. Method of and installation for putting stacks of coins into cartridges. 4,677,811, Cl. 53-456.000.

Brison, Marc P., to Moulinex, Societe Anonyme. Blade set for an electrical knife. 4,677,749, Cl. 30-355.000.

British Petroleum Company, p.l.c., The: *See*—
Chinery, David, 4,677,859, Cl. 73-861.720.

British Telecommunications public limited company: *See*—
McKeown, James H. A., 4,679,248, Cl. 455-226.000.

Britzke, Sylvia: *See*—
Heist, Hans; Toepfer, Dieter; and Britzke, Sylvia, 4,678,310, Cl. 354-319.000.

Bro, William J.; and Carter, L. Philip. Apparatus and method for determining intracranial pressure and local cerebral blood flow. 4,677,985, Cl. 128-691.000.

Brock, Robert E., to Triangle Tool Corporation. Injection mold including mold sidewall locking bars. 4,678,158, Cl. 249-161.000.

Brockhaus, Peter B. Convertible cooler and cushion. 4,679,242, Cl. 383-4.000.

Brocklehurst, John R.: *See*—
Drake, Cyril F.; and Brocklehurst, John R., 4,678,659, Cl. 424-451.000.

Broken Hill Proprietary Company Limited, The: *See*—
Debenham, Michael; and Farfor, James D., 4,677,757, Cl. 34-4.000.

Bronstad, Maurice E.; Hatton, James H., Jr.; and Meczkowski, Leonard C., to Southwest Research Institute. Eccentric loader guardrail terminal. 4,678,166, Cl. 256-13.100.

Brookfield Engineering Laboratories, Inc.: *See*—
Curtis, Harold W., 4,678,978, Cl. 318-690.000.

Brooks, Kenneth L.; Bufkin, Paul R.; Mihal, David G.; and Miller, Jerry G., to American Telephone and Telegraph Company AT&T Bell Laboratories. Method and apparatus for providing a ground reference for telephone customer special circuits powered from a floating battery feed. 4,679,232, Cl. 379-413.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hori, Masaaki, 4,678,979, Cl. 318-696.000.

Brown, Boveri & Cie AG: *See*—
Depenbrock, Manfred, 4,678,248, Cl. 318-805.000.

Brown, Dale M., to General Electric Company. Self-aligned inlay transistor with or without source and drain self-aligned metallization extensions. 4,677,736, Cl. 29-571.000.

Brown, Max A. Agricultural chemical applicator. 4,677,921, Cl. 111-6.000.

Brown, Melvin H., to Aluminum Company of America. Corrosion-resistant support apparatus and method of use for inert electrodes. 4,678,548, Cl. 204-67.000.

Brown, Richard K.: *See*—
Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., 4,678,882, Cl. 219-10.55E.

Brown & Williamson Tobacco Corporation: *See*—
Denier, Robert F.; Marshall, Robert H.; Jewell, John N.; and Litzinger, Elmer F., 4,677,994, Cl. 131-310.000.
Luke, John A., 4,677,996, Cl. 131-336.000.

Brownrigg, Neville J., to American Cyanamid Company. Process for alumina recovery. 4,678,585, Cl. 210-727.000.

Bruce, William C., Jr.: *See*—
Peters, Tulley M.; and Bruce, William C., Jr., 4,679,194, Cl. 371-16.000.

Brunn, Klaus, to Siemens Aktiengesellschaft. X-ray diagnostic installation having a control system for the x-ray tube high voltage. 4,679,218, Cl. 378-101.000.

Brush, Robert W., Sr.: *See*—
Gallusser, David O.; Brush, Robert W., Sr.; and MacAvoy, David W., 4,678,260, Cl. 439-607.000.

Brust, Hans-Detlef, to Siemens Aktiengesellschaft. Method and apparatus for spectral analysis of a signal at a measuring point. 4,678,988, Cl. 324-158.00R.

Bryan, Horace; and Giardina, Nicholas. Attachment for smoke alarms. 4,679,037, Cl. 340-693.000.

Buck, Daniel C., to Westinghouse Electric Corp. Magnetostatic-wave device. 4,679,012, Cl. 333-161.000.

Buckle, Brian L. Variable buoyancy apparatus. 4,677,931, Cl. 114-331.000.

Buckley, B. Shawn: *See*—
Pinyan, James A.; and Buckley, B. Shawn, 4,677,852, Cl. 73-628.000.

Buder, Eckart; Metz, Hans-Ulrich; and Ubermeier, Dieter, to Varta Batterie Aktiengesellschaft. Multicell electric storage battery with combined means for waste-gas drying and flame-protection. 4,678,726, Cl. 429-88.000.

Buehler Ltd.: *See*—
Doyle, Ralph R., 4,678,119, Cl. 239-9.000.

Buehrer, Robert J.; and Gargano, William L. B., to FXC Corporation. Removable slider for parachute deployment. 4,678,145, Cl. 244-152.000.

Bufkin, Paul R.: *See*—
Brooks, Kenneth L.; Bufkin, Paul R.; Mihal, David G.; and Miller, Jerry G., 4,679,232, Cl. 379-413.000.

Buhler, Ernst: *See*—
Dresti, Silvano; Buhler, Ernst; and Derighetti, Rene, 4,678,885, Cl. 219-69.00C.

Buhrer, Carl F., to GTE Laboratories Incorporated. Methods of and apparatus for tuning a birefringent optical filter. 4,678,287, Cl. 350-404.000.

Bullen, David A.: *See*—
Anderson, Andrew G.; Bullen, David A.; and Ferguson, Robert G., 4,677,877, Cl. 74-785.000.

Bullock, Joseph J., to Bankers Trust Co. Tamper-resistant container cap. 4,678,094, Cl. 215-256.000.

Bulot, Eric: *See*—
Willson, Richard C., III; Bulot, Eric; and Cooney, Charles L., 4,678,583, Cl. 210-638.000.

Bulst, Wolf-Eckhart; Erthel, Mira; and Zibis, Peter, to Siemens Aktiengesellschaft. Filter functioning with acoustic waves. 4,679,014, Cl. 333-195.000.

Burlingame, Harry H., to Boeing Company, The. Setpoint controller. 4,678,977, Cl. 318-601.000.

Burns, James A., to Becton, Dickinson and Company. Lancet. 4,677,979, Cl. 128-314.000.

Burns, William K.; and Milton, A. Fenner, to United States of America, Navy. Parabolic optical waveguide horns and design thereof. 4,678,267, Cl. 350-96.150.

Burwell, William H., to Union Carbide Corporation. Electrode joint thread form. 4,679,206, Cl. 373-91.000.

Bush, Duane B.: *See*—
Dodge, John L.; Bush, Duane B.; Pechuzal, Georges A.; and Ravindranath, Ambrish, 4,678,398, Cl. 415-181.000.

Bush Industries, Inc.: *See*—
Holler, James M., 4,677,707, Cl. 16-239.000.

Bushey, William R., to Du Pont de Nemours, E. I., and Company. Process for forming solid solutions. 4,678,505, Cl. 75-0.50A.

Buske, Norm. Rotary cam fluid working apparatus. 4,677,950, Cl. 123-241.000.

Butcher, William T.; Furlong, James J.; Howe, Dwayne E.; Snell, Gerald T.; and Yara, Calvin M., to Boeing Company, The. Touch sensor for wire stripper. 4,679,117, Cl. 361-181.000.

Butkus, Joseph S. Fishing rod holder and alarm. 4,677,784, Cl. 43-16.000.

Butler, Douglas B.: *See*—
Bourassa, Ronald R.; and Butler, Douglas B., 4,679,170, Cl. 365-154.000.

Buttiker, Rudolf: *See*—
Punzar, Marianne; Marti, Franz; Mercier, Robert; Tobler, Paul; and Buttiker, Rudolf, 4,678,852, Cl. 544-194.000.

Butts, Gary; Sydo, Lukas; and Rossi, Victor L., to Ling Electronics Inc. Recirculating bearing. 4,678,347, Cl. 384-43.000.

Byczek, Roger W.: *See*—
Romine, Edward L.; and Byczek, Roger W., 4,678,250, Cl. 439-83.000.

C. Reichert Optische Werke AG: *See*—
Nyman, Georg N.; Pauliny, Ferdinand; and Schindl, Klaus P., 4,678,291, Cl. 350-510.000.

Cabot Corporation: *See*—
Sridhar, Narasi; and Crook, Paul, 4,678,523, Cl. 148-325.000.

Cadwell, George H., Jr.; Pittman, Clarence B.; and Bowers, Cecil W., to Flanders Filters, Inc. Laminar flow clean room having improved filter bank. 4,678,487, Cl. 55-385.00A.

Cairns, Thomas M., to Ford Motor Company. Wire insulation stripper guide. 4,677,702, Cl. 7-107.000.

Calabrese, Anthony, to Charles Griener and Company, Inc. Cervical collar permitting tracheotomy. 4,677,969, Cl. 128-75.000.

Calandra, Frank, Jr., to Jennmar Corporation. Roof bolt with expansion shell and threaded nut. 4,678,374, Cl. 405-261.000.

California Institute of Technology: *See*—
Rembaum, Alan, 4,678,814, Cl. 522-175.000.

Callaghan, Vincent M.; and Wolpert, Melvin J., III, to Combustion Engineering, Inc. Method and means for monitoring the continuity of a fluid-filled network of conduits and valves. 4,678,621, Cl. 376-245.000.

Calspan Corporation: *See*—
Lukowski, Frank J., Jr.; and Hammill, Harry B., III, 4,678,329, Cl. 356-152.000.

Camacho, David P.: *See*—
Camacho, Salvador L.; and Camacho, David P., 4,678,888, Cl. 219-121.0PW.

Camacho, Salvador L.; and Camacho, David P., to Plasma Energy Corporation. Power circuit apparatus for starting and operating plasma arc. 4,678,888, Cl. 219-121.0PW.

Camco Inc.: *See*—
St. Louis, Robert M., 4,677,760, Cl. 34-90.000.

Camet, Inc.: *See*—
Retallick, William B., 4,677,839, Cl. 72-402.000.

Campanelli, Michael R.: *See*—
Drake, Donald J.; Campanelli, Michael R.; and Ims, Dale R., 4,678,529, Cl. 156-234.000.

Campbell, Bruce E. Manually assembled puzzle apparatus. 4,678,192, Cl. 273-157.00R.

Campbell, Richard S., Sr.: *See*—
Moorehead, Jack F.; and Campbell, Richard S., Sr., 4,678,564, Cl. 210-108.000.

Campbell, Todd D.: *See*—
Nashef, Aws S.; and Campbell, Todd D., 4,678,470, Cl. 623-16.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Conway, Larry J.; and Pulsifer, Paul I., 4,679,168, Cl. 364-900.000.

Canadian Fram Limited: *See*—
Anderson, Andrew G.; Bullen, David A.; and Ferguson, Robert G., 4,677,877, Cl. 74-785.000.

Canadian Patents and Development Limited: *See*—
Fowler, George A.; Hamilton, James M.; and Whiteway, William J., 4,678,132, Cl. 242-47.090.
Piche, Luc, 4,677,842, Cl. 73-32.00A.
Taylor, Roderick S.; and Leopold, Kurt E., 4,679,203, Cl. 372-86.000.

Candea, Cornell, to Chrysler Motors Corporation. Lubricating system for an engine balancing device. 4,677,948, Cl. 123-192.00B.

Canevari Timber Co., Inc.: *See*—
Durbin, James W., 4,679,139, Cl. 364-200.000.

Cannella, Vincent D.: *See*—
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,677,738, Cl. 29-572.000.

Cannon, Stuart R.; Brazenor, William J.; Kneen, Peter W.; and Mullen, John L., to S. & M. Cannon Pty. Ltd. Canopy. 4,677,999, Cl. 135-117.000.

Canon Kabushiki Kaisha: *See*—
Baba, Takeshi; and Suda, Shigeyuki, 4,678,899, Cl. 230-201.000.
Edakubo, Hiroo, 4,679,099, Cl. 360-10.200.
Hayashi, Kimiyoshi, 4,679,073, Cl. 358-80.000.
Ishikawa, Yasuyuki; and Matsumura, Isao, 4,678,297, Cl. 351-208.000.
Izukawa, Kazuhiro; Tsukimoto, Takayuki; and Okumura, Ichiro, 4,678,956, Cl. 310-323.000.
Kazumi, Jiro, 4,678,304, Cl. 354-173.110.
Kiuchi, Masayoshi, 4,678,306, Cl. 354-217.000.
Masunaga, Makoto; Muramoto, Tomotaka; and Nagasawa, Kenichi, 4,679,066, Cl. 358-29.000.
Nagashima, Nao, 4,679,096, Cl. 358-287.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,678,733, Cl. 430-57.000.
Sato, Yuichi; Tsunekawa, Tokuichi; and Kawabata, Takashi, 4,678,323, Cl. 365-4.000.
Sorimachi, Kanehiro; and Tamari, Makoto, 4,677,778, Cl. 40-476.000.
Sugiura, Susumu; Sugino, Takashi; and Hirose, Naoya, 4,679,074, Cl. 358-80.000.
Takayama, Makoto, 4,679,072, Cl. 358-80.000.
Tezuka, Nobuo, 4,679,101, Cl. 360-60.000.
Yaguchi, Tatsuya, 4,679,093, Cl. 358-257.000.

Capasso, Federico; Cho, Alfred Y.; Hutchinson, Albert L.; and Mohammed, Khalid, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Superlattice photoconductor. 4,679,061, Cl. 357-4.000.

Capers, Donald L.: *See*—
Capers, Jerry W.; Capers, Donald L.; and Capers, Douglas W., 4,678,392, Cl. 414-563.000.

Capers, Douglas W.: *See*—
Capers, Jerry W.; Capers, Donald L.; and Capers, Douglas W., 4,678,392, Cl. 414-563.000.

Capers, Jerry W.; Capers, Donald L.; and Capers, Douglas W., to Hydra-Tech, Inc. Wheel lift for a tow truck. 4,678,392, Cl. 414-563.000.

Capitol Records, Inc.: *See*—
Thomas, Keith E., 4,679,108, Cl. 360-130.310.

Capsule Technology International, Ltd.: *See*—
Tayebi, Amad, 4,677,812, Cl. 53-477.000.

Cari All Inc.: *See*—
Trubiano, Antoine, 4,678,195, Cl. 280-33.99A.

Carl Freudenberg, Firma: *See*—
Rohner, Gerhard; Schweikert, Willi; and Ticks, Gerd-Heinz, 4,678,203, Cl. 280-707.000.

Carl Hurth Machinen- und Zahnradfabrik GmbH & Co.: *See*—
Loos, Herbert; and Erhardt, Manfred, 4,677,962, Cl. 125-11.0CD.

Carlson, Paul R.: *See*—
Carlson, Steven R.; and Carlson, Paul R., 4,678,896, Cl. 235-380.000.

Carlson, Richard J.; and Kemeny, George A., to Westinghouse Electric Corp. Multiple rail electromagnetic launchers with acceleration enhancing rail configurations. 4,677,895, Cl. 89-8.000.
Carlson, Steven R.; and Carlson, Paul R. Point-of sale mechanism. 4,678,896, Cl. 235-380.000.
Carpenter, Roy B., Jr. Method and equipment for lightning protection through electric potential neutralization. 4,679,114, Cl. 361-117.000.
Carr, Peter: *See—*
Bjorkman, Harry K., Jr.; and Carr, Peter, 4,678,656, Cl. 423-500.000.
Carruthers, John: *See—*
Gressett, Charles A., Jr.; Page, John F.; Smith, Daniel J.; and Carruthers, John, 4,677,891, Cl. 84-313.000.
Carter, Clyde T., to Wells Electronics, Inc. Chip connector. 4,678,255, Cl. 439-267.000.
Carter, John W., to Wise Company, Inc., The. Mechanism on a vehicle seat for adjusting stiffness of ride. 4,678,155, Cl. 248-564.000.
Carter, L. Philip: *See—*
Bro, William J.; and Carter, L. Philip, 4,677,985, Cl. 128-691.000.
Caruso, Robert D.; and Messina, Joseph A., to American Telephone and Telegraph Company, AT&T Technologies. Method for adjusting an electrical device by electrode trimming. 4,678,891, Cl. 219-121.0LJ.
Casey, Irene; and Tuse, Daniel, to Casey, Larry; and Casey, Irene. Aerosol germicide and dye. 4,678,658, Cl. 424-7.100.
Casey, Larry: *See—*
Casey, Irene; and Tuse, Daniel, 4,678,658, Cl. 424-7.100.
Cassaday, Michael M., to Technicon Instruments Corporation. Isolation liquid layer retention device. 4,678,641, Cl. 422-101.000.
Cassella Aktiengesellschaft: *See—*
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, 4,678,476, Cl. 8-639.000.
Castagno, Aldo, to Fiat Auto S.p.A. Weather strip for a motor-vehicle. 4,678,227, Cl. 296-213.000.
Castonguay, Roger N.: *See—*
Todaro, Frank A.; Castonguay, Roger N.; Krajewski, Alexander A.; and Morris, Robert A., 4,679,019, Cl. 335-172.000.
Catania, James N. Method for making photographic mattes. 4,678,740, Cl. 430-356.000.
Catonne, Jean-Claude: *See—*
Rignon, Maurice; Catonne, Jean-Claude; Denisard, Francoise; and Malafosse, Jean, 4,678,549, Cl. 204-74.000.
Catros, Jean-Yves; and Michler, Denis, to Thomson Video Equipment. Method and system for bit-rate compression of digital data transmitted between a television transmitter and a television receiver. 4,679,079, Cl. 358-135.000.
Cattano, John D.: *See—*
Simonton, R. D.; Cattano, John D.; and Mason, Robert K., 4,678,729, Cl. 429-129.000.
Celanese Corporation: *See—*
Elmore, Jimmy D.; and Goff, Elizabeth S., 4,678,843, Cl. 525-378.000.
Rosenfeld, Jerold C., 4,678,825, Cl. 524-83.000.
Centre National de la Recherche Scientifique: *See—*
Constant, Eugene; Leroy, Yves; and Van De Velde, Jean-Claude, 4,677,988, Cl. 128-736.000.
Centre National d'Etudes Spatiales: *See—*
Rouzies, Christian, 4,678,983, Cl. 323-222.000.
Cerni, Samuel: *See—*
Wilson, John F.; Gjertsen, Robert K.; and Cerni, Samuel, 4,678,618, Cl. 376-156.000.
Cerny, Gene L. Apparel drying tray. 4,677,764, Cl. 34-195.000.
Cervena, Irena: *See—*
Protiva, Miroslav; Jilek, Jiri; Cervena, Irena; Dlabac, Antonin; Valchar, Martin; and Pomykacek, Josef, 4,678,788, Cl. 514-254.000.
Chabrol, Jean-Jacques; and Lambert, Jean-Pierre, to Composites Aquitaine S. A.; and Etablissements Poirier S.A. Armchair, particularly for handicapped persons, equipped with a device for rapidly locking the foot rest. 4,678,233, Cl. 297-429.000.
Chai, Hung Y.: *See—*
Wong, Hoi W.; and Chai, Hung Y., 4,679,078, Cl. 380-15.000.
Chamberlain Manufacturing Corporation: *See—*
Krishnakumar, C. K.; and Schafer, Clyde K., 4,678,116, Cl. 236-25.00A.
Chamran, Delories M., executrix: *See—*
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,679,162, Cl. 364-571.000.
Chamran, Morteza M., deceased: *See—*
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,679,162, Cl. 364-571.000.
Chan, Albert S. C., to Monsanto Company. Pyrophosphate coating process for calcium carbonate dental abrasives. 4,678,662, Cl. 424-57.000.
Chang, Clarence D.; Penick, Joe E.; and Socha, Richard F., to Mobil Oil Corporation. Conversion of LPG hydrocarbons to distillate fuels or lubes using integration of LPG dehydrogenation and MOGDL. 4,678,645, Cl. 422-190.000.
Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Method for reclaiming heat-damaged catalysts. 4,678,763, Cl. 502-26.000.
Chang, Wen-Hsuan; Dufford, Edward L.; Erikson, J. Alden; and Prucnal, Paul J., to PPG Industries, Inc. Coating composition containing an ungelled reaction product as a curative. 4,678,835, Cl. 525-100.000.
Chao, Fred C.: *See—*
Rowe, William S.; and Chao, Fred C., 4,678,622, Cl. 376-259.000.
Chao, Herbert S.: *See—*
Hallgren, John E.; Policastro, Peter P.; Chao, Herbert S.; and Johnson, Bruce C., 4,678,839, Cl. 525-390.000.
Chao, Hu H.; and Chau-Chun, Nicky, to International Business Machines Corporation. Boost word-line clock and decoder-driver circuits in semiconductor memories. 4,678,941, Cl. 307-449.000.
Chapelle, Walter E.: *See—*
Johnson, Robert R.; and Chapelle, Walter E., 4,679,085, Cl. 358-160.000.
Yaniv, Zvi; Chapelle, Walter E.; Lien, Shui-Chih A.; and Yang, Mohshi, 4,678,282, Cl. 350-334.000.
Chapput, Andre : *See—*
Delhaye, Michel; Deffontaine, Andre ; Chapput, Andre ; Bridoux, Michel; and Da Silva, Edouard, 4,678,277, Cl. 356-301.000.
Charlebois, Leonard J., to Northern Telecom Limited. Forming of cable splice closures. 4,678,866, Cl. 174-88.00R.
Charles Griener and Company, Inc.: *See—*
Calabrese, Anthony, 4,677,969, Cl. 128-75.000.
Charles Stark Draper Laboratory, Inc., The: *See—*
Coate, Godfrey T.; and Coccoli, Joseph D., 4,678,334, Cl. 356-350.000.
Charonnat, Yves; and Larribe, Lucien, to VIAFRANCE and State of France as represented by the Ministry of Urban Planning, Housing and Transportation, Central Laboratory of Roads and Bridges. Tractor-drawn forming tool for making concrete slabs on the ground. 4,678,364, Cl. 404-105.000.
Chase, Geoffrey S. Support. 4,678,149, Cl. 248-150.000.
Chau-Chun, Nicky: *See—*
Chao, Hu H.; and Chau-Chun, Nicky, 4,678,941, Cl. 307-449.000.
Chaushev, Sotir Y.: *See—*
Stambolov, Lyuben K.; Chaushev, Sotir Y.; and Simitchiev, Dilyan L., 4,678,615, Cl. 261-111.000.
Chayka, Stanley J.: *See—*
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,679,067, Cl. 358-29.000.
Chen, Johnson C., to Pennwalt Corporation. Selective electrolytic stripping of metal coatings from base metal substrates. 4,678,552, Cl. 204-146.000.
Chen, Wuu-Nan: *See—*
Ham, George E.; Chen, Wuu-Nan; and McIntyre, John M., 4,678,601, Cl. 252-500.000.
Chenevard, Alexis, to Sapal, Societe Anonyme des Plieuses Automatiques. Assembly for assorted packings with different products. 4,677,808, Cl. 53-238.000.
Cheng, Eric K., to Reyloc Limited. Apparatus for supporting or erecting structures. 4,678,152, Cl. 248-225.100.
Cheng, Tseng-Yng. Signalling device for indicating a nursed person in a bad sleeping condition. 4,679,036, Cl. 340-573.000.
Cherry Semiconductor Corporation: *See—*
Skoutas, James P., 4,679,006, Cl. 331-111.000.
Chevron Research Company: *See—*
Holland, John M., 4,679,252, Cl. 455-619.000.
King, William F., 4,678,804, Cl. 514-493.000.
Chiang, Robert L.; and Staniulis, Mark T., to Union Carbide Corporation. Catalytic cracking catalysts for high octane gasoline products. 4,678,765, Cl. 502-65.000.
Chicago Metallic Corporation: *See—*
Vukmanic, Ronald W., 4,677,802, Cl. 52-488.000.
Chicago Show Printing Co.: *See—*
Barnett, Earl D.; and Mundstock, Robert W., 4,678,095, Cl. 220-4.00F.
Chigira, Masayoshi: *See—*
Nakamura, Kazuhito; Sasaki, Hisami; Chigira, Masayoshi; and Yokoi, Kenji, 4,678,590, Cl. 252-8.800.
Chikamasa, Hiroshi: *See—*
Asai, Takamitsu; Akashi, Goro; Kitamoto, Tatsuji; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,678,682, Cl. 427-48.000.
Chinery, David, to British Petroleum Company, p.l.c., The. Flow meter. 4,677,859, Cl. 73-861.720.
Chiyoma, Hitoshi; Watanabe, Zensaku; and Nakagawa, Masahiro, to Kabushiki Kaisha Toshiba. Image sensor with means to adjust capacitance of signal leads. 4,679,088, Cl. 358-213.180.
Chizek, Michael, to Contour Chair-Lounge Co., Inc. Adjustable chair. 4,678,231, Cl. 297-329.000.
Cho, Alfred Y.: *See—*
Capasso, Federico; Cho, Alfred Y.; Hutchinson, Albert L.; and Mohammed, Khalid, 4,679,061, Cl. 357-4.000.
Choksi, Pradip V., to SpaceLabs Inc. Gas sampling apparatus for capnography. 4,677,987, Cl. 128-719.000.
Chomerics, Inc.: *See—*
Tzeng, Wen-Shian V., 4,678,716, Cl. 428-551.000.
Chonan, Katsuhiko: *See—*
Sugimoto, Shigeyuki; Kato, Masayuki; and Chonan, Katsuhiko, 4,678,980, Cl. 318-759.000.
Chown, David P. M., to International Standard Elecric Corporation. Optical receiver. 4,679,251, Cl. 455-619.000.
Christopulos, John A., to United States of America, Army. Interconnector device. 4,678,728, Cl. 429-121.000.
Chrysler Motors Corporation: *See—*
Betterton, Joseph T.; and Glover, Alfred H., 4,678,362, Cl. 403-373.000.
Candea, Cornell, 4,677,948, Cl. 123-192.00B.
Eastman, Richard E.; and Williams, Randolph C., 4,677,873, Cl. 74-665.0GE.
Emmer, Eric D., 4,677,722, Cl. 29-156.50A.
Filkins, Timothy J., 4,677,868, Cl. 74-359.000.

Hormel, Ronald F., 4,677,754, Cl. 33-361.000.
Schenten, James L., 4,678,240, Cl. 303-6.00C.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Usami, Hiroko; Yamamoto, Akihiro; Sugawara, Yutaka; Kotani, Shozo; and Kato, Keijiro, 4,678,773, Cl. 514-25.000.

Ciarcia, Ronald D.; DiVincenzo, Gregory T.; Bernier, Richard E.; and Nagy, Joseph G., to General Electric Company. Interchangeable mechanism for molded case circuit breaker. 4,679,016, Cl. 335-132.000.

Ciba Corning Corp.: *See*—
Hoskins, Michael K., 4,678,754, Cl. 436-15.000.

Ciba-Geigy AG: *See*—
Moss, Brian F.; Brent, Richard J.; and Pilkington, Ian B., 4,678,307, Cl. 354-313.000.
Moss, Brian F.; and Brent, Richard J., 4,678,308, Cl. 354-313.000.
Moss, Brian F.; and Brent, Richard J., 4,678,309, Cl. 354-313.000.
Punzar, Marianne; Marti, Franz; Mercier, Robert; Tobler, Paul; and Buttiker, Rudolf, 4,678,852, Cl. 544-194.000.

Ciba-Geigy Corporation: *See*—
Back, Gerhard; Schutz, Hans U.; and Schlesinger, Ulrich, 4,678,851, Cl. 534-619.000.
Hurter, Rudolf, 4,678,611, Cl. 260-510.000.
Janssen, Robert A., 4,678,838, Cl. 525-326.900.
Liu, Marie W.; and Ho, Victor, 4,678,849, Cl. 526-259.000.
Pastor, Stephen D.; and Hessell, Edward T., 4,678,826, Cl. 524-104.000.
Stanton, James L.; and Ksander, Gary M., 4,678,800, Cl. 514-412.000.

Cincinnati Microwave, Inc.: *See*—
Washburn, Clyde, Jr., 4,679,247, Cl. 455-210.000.

Cincinnati Milacron Inc.: *See*—
Gibbemeyer, Joseph F., 4,678,425, Cl. 425-522.000.
Mayfield, Ralph W., 4,677,869, Cl. 74-424.80R.

Cinzori, Robert J.: *See*—
Kern, Mark T.; and Cinzori, Robert J., 4,679,156, Cl. 364-551.000.

Citizen Watch Company Limited: *See*—
Morokawa, Shigeru, 4,679,043, Cl. 340-784.000.
Nikaido, Akira, 4,678,951, Cl. 310-13.000.

Claessen, Johannes A. H., to Heuga Holding b.v. Antistatic carpet tile and method of manufacturing such carpet tile. 4,678,694, Cl. 428-95.000.

Clark, Robert. Bidirectional current time integration device. 4,679,000, Cl. 324-428.000.

Claus, Michael J.: *See*—
Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., 4,678,752, Cl. 435-291.000.

CLECIM: *See*—
Bessey, Guy; and Bimbert, Claude, 4,677,838, Cl. 72-254.000.

Cloutier, Donald C., to M/A-COM, Inc. Polarized signal receiving apparatus. 4,679,009, Cl. 333-21.00A.

Clucas, Robert A.: *See*—
Pfaff, Paul H.; Spagna, Richard N.; Clucas, Robert A.; Coulson, Paul; and Eskandry, Ezra D., 4,679,035, Cl. 340-572.000.

Coate, Godfrey T.; and Coccoli, Joseph D., to Charles Stark Draper Laboratory, Inc., The. Spliceless optical fiber resonant ring laser gyroscopic system. 4,678,334, Cl. 356-350.000.

Coates, William J.: *See*—
Roe, Anthony M.; Coates, William J.; Slater, Robert A.; Breukelman, Stephen P.; and Meakins, George D., 4,678,786, Cl. 514-247.000.

Coccoli, Joseph D.: *See*—
Coate, Godfrey T.; and Coccoli, Joseph D., 4,678,334, Cl. 356-350.000.

Cochlea Corporation: *See*—
Pinyan, James A.; and Buckley, B. Shawn, 4,677,852, Cl. 73-628.000.

Coffin, Louis F., Jr.; and Prater, Thomas A., to Electric Power Research Institute, Inc. Method for measuring damage to structural components. 4,677,855, Cl. 73-799.000.

Cohen, David A.; and Papurt, David M., to Laser Metric Systems, Inc. Laser based gaging system and method of using same. 4,678,337, Cl. 356-387.000.

Cohen, David J.: *See*—
Cox, Michael W.; Levin, Richard I.; Cohen, David J.; and Frisbie, William R., 4,679,144, Cl. 364-417.000.

Cohen, Uri. Record member with metallic antifriction overcoat. 4,678,722, Cl. 428-642.000.

Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, to Metropolitan Wire Corporation. Surgical case cart. 4,678,214, Cl. 292-213.000.

Cole, William C.: *See*—
Meares, Claude F.; DeNardo, Sally J.; Cole, William C.; and Mol, Min K., 4,678,667, Cl. 424-85.000.

Colegate, Gilbert W. P.: *See*—
Gunn, Duncan A.; Crownshaw, John C.; Davis, Arthur A.; and Colegate, Gilbert W. P., 4,678,270, Cl. 350-96.200.

Colgate-Palmolive Company: *See*—
Parfomak, Eva H.; and Uchiyama, Winston S., 4,678,594, Cl. 252-186.310.

Collin, William D., to Huddy Diamond Crown Setting Company (Proprietary) Limited. Cutter inserts for picks. 4,678,237, Cl. 299-79.000.

Colson Castors (Europe) Limited: *See*—
Screen, Stafford T., 4,677,706, Cl. 16-35.00R.

Comberg, Albert A.; and Schroder, Johann, to U.S. Philips Corporation. Projection television display tube with improved cooling. 4,678,961, Cl. 313-36.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Itoh, Masao; Itoh, Akira; and Takano, Hiroshi, 4,678,182, Cl. 272-73.000.

Combustion Electromagnetics, Inc.: *See*—
Ward, Michael A. V., 4,677,960, Cl. 123-598.000.

Combustion Engineering, Inc.: *See*—
Callaghan, Vincent M.; and Wolpert, Melvin J., III, 4,678,621, Cl. 376-245.000.
Rankin, Arthur L., III, 4,678,131, Cl. 241-293.000.

Commissariat a l'Energie Atomique: *See*—
Loriot, Pierre; Rendu, Michel; Rousseau, Jean; and Samoel, Alain, 4,678,924, Cl. 29-407.000.

Commodore Business Machines Inc.: *See*—
Yannes, Robert J., 4,677,890, Cl. 84-1.190.

Commonwealth Scientific & Industrial Organization: *See*—
Hollis, Richard G., 4,678,507, Cl. 75-24.000.

Compagnie Francaise de Produits Industriels: *See*—
Schapira, Joseph; Ken, Victor; Thery, Denis; and Jelodin, Stephane, 4,678,519, Cl. 148-6.15Z.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Arnould, Emmanuel; and Dugre, Jean-Pierre, 4,679,163, Cl. 364-725.000.

Composites Aquitaine S. A.: *See*—
Chabrol, Jean-Jacques; and Lambert, Jean-Pierre, 4,678,233, Cl. 297-429.000.

Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., to Intertec Associates Inc. Plastic laboratory condenser. 4,678,028, Cl. 165-72.000.

Conlon, Ralph D.: *See*—
Helms, Charles C.; Conlon, Ralph D.; and Delany, Edward B., 4,678,917, Cl. 250-373.000.

Connan, Jean-Louis; and Huiban, Jean-Yves. Electrical disturbance protective device between a terminal and a telephone line. 4,679,115, Cl. 361-119.000.

Conoco Inc.: *See*—
Barnes, John R.; Diamond, John E.; and Griffin, Graham J., 4,678,147, Cl. 248-74.100.

Consiglio Nazionale Delle Ricerche Roma: *See*—
Russo, Vera; Sottini, Stefano; Righini, Giancarlo; and Trigari, Silvana, 4,678,268, Cl. 350-96.180.

Constant, Eugene; Leroy, Yves; and Van De Velde, Jean-Claude, to Centre National de la Recherche Scientifique. Method and apparatus for measuring microwave noise. 4,677,988, Cl. 128-736.000.

Contour Chair-Lounge Co., Inc.: *See*—
Chizek, Michael, 4,678,231, Cl. 297-329.000.

Conway, Larry J.; and Pulsifer, Paul I., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Intelligent broad band digital RF memory. 4,679,168, Cl. 364-900.000.

Cook, Donald A., to Coronet Industries, Inc. Suspended creel. 4,678,136, Cl. 242-131.000.

Cooney, Charles L.: *See*—
Willson, Richard C., III; Bulot, Eric; and Cooney, Charles L., 4,678,583, Cl. 210-638.000.

Cooper Industries, Inc.: *See*—
Cox, Albert R., 4,678,864, Cl. 174-36.000.

Coopervision, Inc.: *See*—
Morland, Albert H.; and Phoenix, John T., 4,677,729, Cl. 29-426.500.

Copp, Warren K., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Oronasal mask assemblies. 4,677,713, Cl. 24-590.000.

Cordani, Eugene J.: *See*—
Dugge, Richard H.; and Cordani, Eugene J., 4,677,917, Cl. 105-248.000.

Cordis Corporation: *See*—
DeCote, Robert, Jr., 4,677,986, Cl. 128-697.000.

Cordis Europa N.V.: *See*—
Feijen, Jan; and Hennink, Wilhelmus E., 4,678,671, Cl. 424-443.000.

Corke, Michael: *See*—
Jackson, David A.; Corke, Michael; Kersey, Alan D.; and Jones, Julian D. C., 4,678,909, Cl. 250-231.00P.

Cornelius, Charles A.: *See*—
Robinson, John S.; Ahlswede, Thomas E.; and Cornelius, Charles A., 4,679,153, Cl. 364-523.000.

Coronet Industries, Inc.: *See*—
Cook, Donald A., 4,678,136, Cl. 242-131.000.

Corporate Communications Consultants, Inc.: *See*—
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,679,067, Cl. 358-29.000.

Corrie, Brian L.; Benn, Pauline; and McElevey, Michael J., to Tektronix, Inc. Self aligned zero overlap charge coupled device. 4,677,737, Cl. 29-571.000.

Cossetti, Giuliano, to Seima Italiana S.p.A. Connectors for the connection of lights on motor vehicles. 4,678,258, Cl. 439-571.000.

Cotter, Richard; Johnson, Robert C.; Rowe, W. Bruce; and Young, Susan K., to Baxter Travenol Laboratories, Inc. Method for directed visceral metabolism of medium chain triglycerides. 4,678,807, Cl. 514-552.000.

Cotter, Richard: *See*—
Ward, Michael V.; and Cotter, Richard, 4,678,808, Cl. 514-560.000.

Coulson, Paul: *See—*
Pfaff, Paul H.; Spagna, Richard N.; Clucas, Robert A.; Coulson, Paul; and Eskandry, Ezra D., 4,679,035, Cl. 340-572.000.
Coursant, Roger H., to U.S. Philips Corporation. Device for the examination of objects by ultrasonic echography with angular focusing. 4,677,981, Cl. 128-660.000.
Courvoisier, Guy: *See—*
Arieh, Simon; and Courvoisier, Guy, 4,677,771, Cl. 36-120.000.
Cousty, Jean Pierre, to Technip Geoproduction. Raising method and device, in particular for an oil exploiting platform. 4,678,372, Cl. 405-196.000.
Cox, Albert R., to Cooper Industries, Inc. Mass terminable flat cable assembly with readily separable ground plane. 4,678,864, Cl. 174-36.000.
Cox, Michael W.; Levin, Richard I.; Cohen, David J.; and Frisbie, William R., to Q-Med, Inc. Cardiac signal real time monitor and method of analysis. 4,679,144, Cl. 364-417.000.
Crabb, Douglas R.: *See—*
Mathews, Linden H.; and Crabb, Douglas R., 4,677,795, Cl. 52-63.000.
Craig, Gale M., to General Motors Corporation. Transistor protection circuit for automotive motor control applications. 4,679,112, Cl. 361-33.000.
Craig, Preston S.; and Arendale, William F., to United Technologies Corporation. Non-optimum waveguide optical sensor. 4,678,328, Cl. 356-141.000.
Crane, Russell M.: *See—*
Maloney, Christopher E.; and Crane, Russell M., 4,679,202, Cl. 372-65.000.
Crank, Ronald K.: *See—*
Llinas, Rodolfo R.; Sugimori, Mutsuyuki; and Crank, Ronald K., 4,677,982, Cl. 128-664.000.
Cranney, Don H.; Gordon, David L.; and Hales, Richard H., to IRECO Incorporated. Cast explosive composition and method. 4,678,524, Cl. 149-21.000.
Cratsa, Steve N. Fishing rod tender with automatic fish hook setting feature. 4,677,783, Cl. 43-15.000.
Crawford Fitting Co.: *See—*
Zahuranec, Emery J.; and Musil, James C., 4,678,380, Cl. 408-211.000.
Crocker, Robert L.: *See—*
Bowyer, William H.; Crocker, Robert L.; Hansford, Christopher M.; Parker, Leslie K.; and Gray, Nigel, 4,678,194, Cl. 273-373.000.
Crook, Paul: *See—*
Sridhar, Narasi; and Crook, Paul, 4,678,523, Cl. 148-325.000.
Crookshanks, Rex J., to Hughes Aircraft Company. Calibrated overlapping frequency sweep. 4,679,161, Cl. 364-571.000.
Cross, Dan A.: *See—*
Bloch, Joseph T.; and Cross, Dan A., 4,677,734, Cl. 29-564.200.
Crossley, Roger, to John Wyeth & Brother Limited. N-pyridyl-substituted pyridine-2-carboxamide-1-oxides. 4,678,794, Cl. 514-332.000.
Crow, Robert W. Facial protector for batting helmet. 4,677,694, Cl. 2-9.000.
Crownshaw, John C.: *See—*
Gunn, Duncan A.; Crownshaw, John C.; Davis, Arthur A.; and Colegate, Gilbert W. P., 4,678,270, Cl. 350-96.200.
Crute, Billy G., to Stant Inc. Breakaway gas gap. 4,678,097, Cl. 220-288.000.
Crystal, Richard G.: *See—*
Gabor, Andrew; Dunfield, John C.; Bowers, George W., Jr.; and Crystal, Richard G., 4,678,355, Cl. 400-389.000.
Csapody, Miklos, to Tungsram Rt. High pressure sodium vapor lamp with improved color reproduction index. 4,678,958, Cl. 313-15.000.
Culligan International Company: *See—*
Norton, William W., 4,678,565, Cl. 210-110.000.
Culp, Gordon W.: *See—*
Nason, Clyde K.; and Culp, Gordon W., 4,678,408, Cl. 417-410.000.
Cumpston, Edward H. Pumped flow attrition disk zone. 4,678,127, Cl. 241-46.040.
Cunningham, Howard W. Apparatus for separating honey and beeswax. 4,678,569, Cl. 210-187.000.
Cunningham, William B., Jr.: *See—*
Nitchman, Harold L.; and Cunningham, William B., Jr., 4,678,101, Cl. 222-82.000.
Curley, Charles M., to SCM Corporation. Right margin zone hyphenation. 4,678,351, Cl. 400-64.000.
Curtis, Harold W., to Brookfield Engineering Laboratories, Inc. Quieting circuits for permanent magnet synchronous motors. 4,678,978, Cl. 318-690.000.
Curtis, Stephen P.; and Jordan, Gary V., to Senelco Limited. Transponder systems. 4,679,046, Cl. 342-51.000.
Custom-Bilt Machinery, Inc.: *See—*
Faltin, Hans G., 4,678,172, Cl. 270-18.000.
CX/OXYTECH, Inc.: *See—*
Elfline, Geraldine S., 4,678,584, Cl. 210-719.000.
CXC Corporation: *See—*
Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Rigsbee, Everett O., III; and Teener, Michael D., 4,679,191, Cl. 370-84.000.
Czaby, Gottfried: *See—*
Visek, Tomas; Czaby, Gottfried; and Nowotny, Georg, 4,677,952, Cl. 123-372.000.
Dagna, Giandomenico, to Ing. C. Olivetti & C., S.p.A. High speed ink jet printer with improved electrical connection to the nozzles. 4,679,059, Cl. 346-140.00R.
Dagorn, Christian: *See—*
Lassaux, Jean; and Dagorn, Christian, 4,679,230, Cl. 379-411.000.
Dahan, Paul C., to Mobil Oil Corporation. Device for rescuing personnel from waters. 4,678,446, Cl. 441-80.000.
Dahl, Erik Q.; Vatland, Arnfinn; and Vegge, Olaf T., to Elkem a/s. Baking furnace for electrodes. 4,678,434, Cl. 432-242.000.
Dahlem, Wolfgang, to ZF-Herion-Systemtechnik GmbH. Progressively movable holding device. 4,677,936, Cl. 118-307.000.
Dahlerud, Ole C., to Tandberg Data A/S. Method and arrangement for positioning a magnetic head to various tracks of a magnetic tape. 4,679,104, Cl. 360-78.000.
Dahlquist, John; Goss, John; and Wennerberg, Gunnar, to Measurex Corporation. System and process for measuring and correcting the values of a parameter of a sheet material. 4,678,915, Cl. 250-358.100.
Dai, Xing-yi: *See—*
Zhang, Yun-xiang; Dai, Xing-yi; Lu, Zhi-kang; and Zeng, Sen, 4,678,847, Cl. 526-206.000.
Daicel Chemical Industries, Ltd.: *See—*
Tanaka, Kazunobu; and Mori, Kyozo, 4,678,602, Cl. 252-513.000.
Daikoku, Takahiro: *See—*
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.
Daimaru, Akimasa: *See—*
Ban, Keisuke; and Daimaru, Akimasa, 4,677,901, Cl. 92-213.000.
Daimler-Benz Aktiengesellschaft: *See—*
Steinkamper, Reinhard; Boll, Wolf; and Peitsmeier, Karl, 4,678,361, Cl. 403-359.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Kawabata, Juheiji; Sugie, Toshinori; Kobata, Fumihiro; and Hirayama, Akira, 4,678,831, Cl. 524-496.000.
Dainippon Screen Manufacturing Co., Ltd.: *See—*
Kitagawa, Osamu, 4,679,071, Cl. 358-75.000.
Kitamura, Hideaki; and Yamada, Mitsuhiko, 4,679,095, Cl. 358-280.000.
Mitsuka, Ikuo, 4,679,155, Cl. 364-525.000.
Teraoka, Hideyuki, 4,678,432, Cl. 432-12.000.
Dallenbach-Toelke, Karin: *See—*
Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.
Dallinger, James F., to New Holland Inc. Paddle wheel assembly for forage harvesters. 4,678,129, Cl. 241-101.700.
Dalman, Austin L. Drum for mixing and dispensing feed material. 4,678,342, Cl. 366-186.000.
D'Amico, Carl: *See—*
Sjogren, Christer A.; and D'Amico, Carl, 4,678,387, Cl. 414-47.000.
Danby Pty. Ltd.: *See—*
Allen, Peter, 4,678,370, Cl. 405-154.000.
Danree, Bernard, to Institut de Recherches Chimiques et Biologiques of Appliques (I.R.C.E.B.A.). Medical uses of halogenobenzohenoneoxime derivatives. 4,678,810, Cl. 514-640.000.
Dansk Industri Syndikat A/S: *See—*
Mogensen, Vagn, 4,678,021, Cl. 164-40.000.
Dantlgraber, Jorg, to Mannesmann Rexroth G.m.b.H. Adjusting apparatus for a vane pump or radial piston pump. 4,678,412, Cl. 418-26.000.
Darby, H. Darrell. Shock absorbing surgical shoe. 4,677,767, Cl. 36-102.000.
Darras, Robert L., to MD Associates. Method of reducing soft tissue swelling and pain. 4,678,668, Cl. 424-94.750.
Dartey, Clemence K.; and Biggs, Richard H., to Nabisco Brands, Inc. Reduced calorie crackers and processes for producing same. 4,678,672, Cl. 426-19.000.
Da Silva, Edouard: *See—*
Delhaye, Michel; Deffontaine, Andre ; Chapput, Andre ; Bridoux, Michel; and Da Silva, Edouard, 4,678,277, Cl. 356-301.000.
Data General Corporation: *See—*
Epstein, David I.; and Holland, Charles J., 4,679,138, Cl. 364-200.000.
Davidson, John P.: *See—*
Noble, Philip C.; Tullos, Hugh S.; and Davidson, John P., 4,678,471, Cl. 623-16.000.
Davies, Richard E. Identification verification method and system. 4,679,236, Cl. 380-23.000.
Davies, Ronald C., to Digital Products Corporation. Methods and apparatus employing apparent resonant properties of thin conducting materials. 4,678,994, Cl. 324-236.000.
Davis, Arthur A.: *See—*
Gunn, Duncan A.; Crownshaw, John C.; Davis, Arthur A.; and Colegate, Gilbert W. P., 4,678,270, Cl. 350-96.200.
Davis, Aurthur A.; and Eady, Robert W., to Standard Telephones and Cables plc. Optical repeaters. 4,679,250, Cl. 455-601.000.
Davis, George B. Christmas tree lighting control. 4,678,926, Cl. 307-11.000.
Davis, William M., to United Pharmaceuticals, Inc. Anti-spasmodic agents having a ring in the main chain. 4,678,780, Cl. 514-183.000.
Dayco Products, Inc.: *See—*
Hollaway, Gerald C., Jr., 4,678,455, Cl. 474-263.000.
Masseth, David A., 4,677,751, Cl. 33-143.00M.
De La Rue Giori S.A.: *See—*
Kuhfuss, Runwalt, 4,677,910, Cl. 101-93.010.

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Deavenport, Joe E.: *See*—
Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., 4,678,450, Cl. 446-405.000.

Debenham, Michael; and Farfor, James D., to Broken Hill Proprietary Company Limited, The. Oven. 4,677,757, Cl. 34-4.000.

Decker, Paula: *See*—
Kallianos, Andrew G.; Sprinkel, Francis M., Jr.; and Decker, Paula, 4,677,995, Cl. 131-335.000.

DeCote, Robert, Jr., to Cordis Corporation. Unsaturable sense amplifier for pacer system analyzer. 4,677,986, Cl. 128-697.000.

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Verhulst, Michael J.; and Anstey, Henry D., 4,677,807, Cl. 53-118.000.

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Delhaye, Michel; Deffontaine, Andre ; Chapput, Andre ; Bridoux, Michel; and Da Silva, Edouard, 4,678,277, Cl. 356-301.000.

Deibler, Melvin E.: *See*—
Loce, Robert P.; and Deibler, Melvin E., 4,678,311, Cl. 355-1.000.

de Jong, Anno: *See*—
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.

Delaney, Michael J.: *See*—
Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.

Delany, Edward B.: *See*—
Helms, Charles C.; Conlon, Ralph D.; and Delany, Edward B., 4,678,917, Cl. 250-373.000.

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Kampfer, Konrad; Rieger, Wolfhart; Gauckler, Ludwig; and Dellapina, Marco, 4,678,758, Cl. 501-80.000.

De Marchi, Jean-Louis; Mabboux, Michel; Paris, Jean; and Kopp, Norbert, to Salomon S.A. Alpine ski boot. 4,677,770, Cl. 36-120.000.

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Benoit, Louis; Mabboux, Michel; Nerrinck, Bernard; and De Marchi, Jean-Louis, 4,677,768, Cl. 36-117.000.

DeNardo, Sally J.: *See*—
Meares, Claude F.; DeNardo, Sally J.; Cole, William C.; and Mol, Min K., 4,678,667, Cl. 424-85.000.

den Broeder, Friedrich J. A.; Draaisma, Henricus J. G.; and Kahle, Alexander, to U.S. Philips Corporation. Magnetic recording medium. 4,678,721, Cl. 428-607.000.

Denier, Robert F.; Marshall, Robert H.; Jewell, John N.; and Litzinger, Elmer F., to Brown & Williamson Tobacco Corporation. Process for treating, drying and expanding tobacco. 4,677,994, Cl. 131-310.000.

Denisard, Francoise. *See*—
Rignon, Maurice; Catonne, Jean-Claude; Denisard, Francoise; and Malafosse, Jean, 4,678,549, Cl. 204-74.000.

Denner, Manuel. Apparatus for in-camera identity marking of film. 4,678,301, Cl. 354-106.000.

Depenbrock, Manfred, to Brown, Boveri & Cie AG. Direct self-control of the flux and rotary moment of a rotary-field machine. 4,678,248, Cl. 318-805.000.

De Raymond, Peter G., to Victaulic Company of America. Gasket for segmented pipe couplings. 4,678,208, Cl. 285-112.000.

Derighetti, Rene: *See*—
Dresti, Silvano; Buhler, Ernst; and Derighetti, Rene, 4,678,885, Cl. 219-69.00C.

Derrico, Gerard G., to Dynapert-HTC Corporation. Vapor phase soldering machine. 4,678,111, Cl. 228-37.000.

Dery, Yves. Set of dices for lottery. 4,678,190, Cl. 273-146.000.

Deseret Medical, Inc.: *See*—
McGary, Charles W.; and Solomon, Donald D., 4,678,660, Cl. 424-25.000.

Deters, Joseph C.: *See*—
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,678,467, Cl. 604-892.000.

Dettling, Joseph C.: *See*—
Wan, Chung-Zong; Dettling, Joseph C.; and Jagel, Kenneth I., 4,678,770, Cl. 502-304.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Harmonic interpolation for producing time variant tones in an electronic musical instrument. 4,677,889, Cl. 84-1.010.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Lahr, Helfrid; and Pontani, Bernd, 4,678,624, Cl. 376-261.000.

Devon County Council: *See*—
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.

Dewey, Loren G., to Amdahl Corporation. Error tracking apparatus in a data processing system. 4,679,195, Cl. 371-29.000.

De Witt, Thomas. Range finding by diffraction. 4,678,324, Cl. 356-45.000.

Deyhle, Henning; and Grisar, Alexaner, to Dyckerhoff Engineering GmbH. Process for the disposal of combustible refuses. 4,678,514, Cl. 106-100.000.

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de la Salle, Christian; and D'Hervilly, Guy, 4,679,169, Cl. 364-900.000.

Dhuyvetter, Timothy A.: *See*—
Huijsing, Johan H.; and Dhuyvetter, Timothy A., 4,678,947, Cl. 307-490.000.

Diamond, John E.: *See*—
Barnes, John R.; Diamond, John E.; and Griffin, Graham J., 4,678,147, Cl. 248-74.100.

Dias, Daniel M.; Kumar, Manoj; Lien, Yeong-Chang L.; and Maruyama, Kiyoshi, to International Business Machines Corporation. Distributed voice-data switching on multi-stage interconnection networks. 4,679,190, Cl. 370-60.000.

Dick, Heinz, to Ford Motor Company. Headlamp-indicator unit for motor vehicles. 4,679,125, Cl. 362-66.000.

Dickmann, Thomas. Vehicle trailer hitch. 4,678,199, Cl. 280-491.00E.

Didier-Werke AG: *See*—
Sommerer, Jurgen; Leipold, Michael; Kainer, Hartmut; and Stein, Hermann, 4,677,731, Cl. 29-526.00R.

Diener, Horst; Albrecht, Ernst; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine housing construction. 4,677,924, Cl. 112-258.000.

Diep, Daniel V., to Nalco Chemical Company. H_2O_2 as a conditioning agent for electrostatic precipitators. 4,678,481, Cl. 55-4.000.

Diesel Kiki Co., Ltd.: *See*—
Kushida, Takeo, 4,678,000, Cl. 137-1.000.
Oshizawa, Hidekazu; and Kondoh, Masami, 4,679,116, Cl. 361-154.000.
Sumikawa, Seiji; and Noguchi, Ichiro, 4,677,830, Cl. 62-126.000.
Takemasa, Masami, 4,677,902, Cl. 98-2.110.
Yamada, Keiichi; and Abe, Tatsuhiko, 4,678,160, Cl. 251-129.020.

Digital Products Corporation: *See*—
Davies, Ronald C., 4,678,994, Cl. 324-236.000.

Dimmick, Vance E.: *See*—
Nervig, Charles H.; and Dimmick, Vance E., 4,678,086, Cl. 211-47.000.

Dirksing, Robert S., to Procter & Gamble Company, The. Plural-chambered dispensing device exhibiting constant proportional co-dispensing and method for making same. 4,678,103, Cl. 222-130.000.

Dischert, Robert A.: *See*—
Topper, Robert J.; and Dischert, Robert A., 4,679,084, Cl. 358-160.000.

Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung: *See*—
Lang, Franz J., 4,678,089, Cl. 211-133.000.

Dissett, Walter L., to Tractech, Inc. Torque-proportioning differential with cylindrical spacer. 4,677,876, Cl. 74-715.000.

Ditsch, John R.; Williams, Theodore G.; and Berrios, Luis H., to HDS, Inc. Hand development system. 4,678,181, Cl. 272-68.000.

DiVincenzo, Gregory T.: *See*—
Ciarcia, Ronald D.; DiVincenzo, Gregory T.; Bernier, Richard E.; and Nagy, Joseph G., 4,679,016, Cl. 335-132.000.

Dixon, Fred W. Poultry delunger apparatus. 4,677,709, Cl. 17-11.000.

Dlabac, Antonin: *See*—
Protiva, Miroslav; Jilek, Jiri; Cervena, Irena; Dlabac, Antonin; Valchar, Martin; and Pomykacek, Josef, 4,678,788, Cl. 514-254.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Beeck, Peter op de; Wuest, Rainer; and Stelter, Norbert, 4,679,145, Cl. 364-424.100.
Kurz, Erich, 4,677,941, Cl. 123-41.120.

Dr. Johannes Heidenhain GmbH: *See*—
Schmitt, Walter, 4,678,948, Cl. 307-511.000.

Dr. Karl Thomae GmbH: *See*—
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.

Dodd, Francis J., to Nuclear Energy Systems, Inc. Weld scanner guide and magnetically susceptible track. 4,677,916, Cl. 104-118.000.

Dodd, Jack G., Jr.; and Dodd, Jeffrey J., to Walter C. McCrone Associates, Inc. Method and apparatus for analyzing the nature of a sample. 4,678,913, Cl. 250-341.000.

Dodd, Jeffrey J.: *See*—
Dodd, Jack G., Jr.; and Dodd, Jeffrey J., 4,678,913, Cl. 250-341.000.

Dodge, John L.; Bush, Duane B.; Pechuzal, Georges A.; and Ravindranath, Ambrish, to Garrett Corporation, The. High efficiency transonic mixed-flow compressor method and apparatus. 4,678,398, Cl. 415-181.000.

Doering, Robert R.; Duane, Michael P.; and Armstrong, Gregory J., to Texas Instruments Incorporated. High density CMOS integrated circuit manufacturing process. 4,677,739, Cl. 29-576.00B.

Doi, Haruo: *See*—
Kamigaito, Osami; Doi, Haruo; Noda, Shoji; Hioki, Tatsumi; Itoh, Akio; and Kakeno, Mitsutaka, 4,678,678, Cl. 427-38.000.

Dolan, Michael J.; Hilbert, Timothy L.; and Snyder, John D., to Mobil Oil Corporation. Methods of particulate measurement. 4,678,483, Cl. 55-97.000.

Dong, Michael W.; Yarbro, Stanley K.; and Vandermark, Frank, to Perkin-Elmer Corporation, The. Apparatus for periodically monitoring the composition of a plurality of samples. 4,678,639, Cl. 422-81.000.

Dorn, Franz; Pfiffner, Albert; and Zehnder, Beat, to Hoffman-La Roche Inc. Certain α-benzyl-3-pyridylmethanols, N-oxides thereof and their fungicidal use. 4,678,790, Cl. 514-277.000.

Dornbracht, Helmut; and Grasse, Klaus-Peter, to Aloys F. Dornbracht GmbH & Co. Connector assembly for a water-dispensing fixture. 4,678,207, Cl. 285-39.000.

Douty, George H.; and Landis, John M., to AMP Incorporated. Multiplane connector system. 4,678,121, Cl. 439-610.000.

Dover, B. Troy: *See—*
Kamienski, Conrad W.; and Dover, B. Troy, 4,678,614, Cl. 260-665.00R.

Dow Chemical Company, The: *See—*
Alderman, Daniel A.; and Wolford, Troy D., 4,678,516, Cl. 106-197.100.
Elliott, Brian W., 4,678,712, Cl. 428-418.000.
Ham, George E.; Chen, Wuu-Nan; and McIntyre, John M., 4,678,601, Cl. 252-500.000.
Johnston, Howard; and Troxell, Lillian H., 4,678,509, Cl. 71-94.000.
Lancaster, Gerald M.; and Allen, James A., 4,678,713, Cl. 428-421.000.
McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,678,833, Cl. 525-66.000.
McKinney, Osborne K.; Allen, James A.; and Flores, David P., 4,678,836, Cl. 525-221.000.
Roodvoets, David L., 4,677,800, Cl. 52-309.120.
Virkar, Anil; and Yuan, Thomas C., 4,678,761, Cl. 501-104.000.

Dow Corning Corporation: *See—*
Gavin, John D., Jr.; and Meddaugh, Michael D., 4,678,376, Cl. 405-270.000.

Doyle, Ralph R., to Buehler Ltd. Abrasive slurry supply system for use in a metallographic sample preparation. 4,678,119, Cl. 239-9.000.

Draaisma, Henricus J. G.: *See—*
den Broeder, Friedrich J. A.; Draaisma, Henricus J. G.; and Kahle, Alexander, 4,678,721, Cl. 428-607.000.

Drake, Cyril F.; and Brocklehurst, John R., to STC, plc. Therapeutic devices incorporating water soluble glass compositions. 4,678,659, Cl. 424-451.000.

Drake, Donald J.; Campanelli, Michael R.; and Ims, Dale R., to Xerox Corporation. Selective application of adhesive and bonding process for ink jet printheads. 4,678,529, Cl. 156-234.000.

Drapier, Albert: *See—*
Henault, Jean-Paul; Drapier, Albert; Grochowski, Guy; and Meslif, Alain, 4,677,939, Cl. 122-17.000.

Dresser Industries, Inc.: *See—*
Janes, Thomas A., 4,678,997, Cl. 324-341.000.

Dresti, Silvano; Buhler, Ernst; and Derighetti, Rene, to AG fur industrielle Elektronik AGIE Losone b. Locarno. Power supply circuit for spark erosion. 4,678,885, Cl. 219-69.00C.

DSPIE "D. Blagoev": *See—*
Stambolov, Lyuben K.; Chaushev, Sotir Y.; and Simitchiev, Dilyan L., 4,678,615, Cl. 261-111.000.

Du Pont Canada Inc.: *See—*
Boivin, Daniel W.; and Zelonka, Ronald A., 4,678,834, Cl. 525-74.000.

Duane, Michael P.: *See—*
Doering, Robert R.; Duane, Michael P.; and Armstrong, Gregory J., 4,677,739, Cl. 29-576.00B.

Duerichen, Johann G. Wood or coal burning heater. 4,677,965, Cl. 126-76.000.

Duerrschnabel, Wolfgang; Puckert, Franz; Stueer, Heinrich; and Bletschacher, Max, to Weiland-Werke AG. Copper-chromium-titanium-silicon alloy and application thereof. 4,678,637, Cl. 420-490.000.

Dufford, Edward L.: *See—*
Chang, Wen-Hsuan; Dufford, Edward L.; Erikson, J. Alden; and Prucnal, Paul J., 4,678,835, Cl. 525-100.000.

Dugge, Richard H.; and Cordani, Eugene J., to ACF Industries, Incorporated. High volume covered hopper car with loading from below and automatic unloading. 4,677,917, Cl. 105-248.000.

Dugle, Thomas E. Rectilinearly traveling vehicle. 4,678,051, Cl. 180-9.100.

Dugliss, Charles H., to American Cyanamid Company. Chemiluminescent composition. 4,678,608, Cl. 252-700.000.

Dugre, Jean-Pierre: *See—*
Arnould, Emmanuel; and Dugre, Jean-Pierre, 4,679,163, Cl. 364-725.000.

Dunaway, Weyman H., to E.C.C. America Inc. Method for calcining kaolin. 4,678,517, Cl. 106-309.000.

Duncan, Eugene F.: *See—*
Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.

Dunfield, John C.: *See—*
Gabor, Andrew; Dunfield, John C.; Bowers, George W., Jr.; and Crystal, Richard G., 4,678,355, Cl. 400-389.000.

Dunromin Enterprises Unlimited, Inc.: *See—*
Avejic, Katarina, 4,678,465, Cl. 604-397.000.

Dupler, Tim: *See—*
Purvis, Gene; Phelps, Russell; Dupler, Tim; Landoll, Patrick; and Landoll, Leonard, 4,678,010, Cl. 138-31.000.

Du Pont de Nemours, E. I., and Company: *See—*
Artz, Steven P., 4,678,498, Cl. 71-87.000.
Bollin, Ernest, Jr.; and Fletcher, Mark G., 4,678,812, Cl. 514-777.000.
Bushey, William R., 4,678,505, Cl. 75-0.50A.
Hanagan, Mary A.; and Thompson, Mark E., 4,678,502, Cl. 71-93.000.
Hay, James V.; and Levitt, George, 4,678,500, Cl. 71-92.000.
Huisman, Hendrikus F.; and Pigmans, Henricus J. M., 4,678,705, Cl. 428-315.900.
Logullo, Francis M., Sr.; Wu, Yun-Tai; and Zahr, George E., 4,678,821, Cl. 523-205.000.
Pasteris, Robert J.; and Muthukrishnan, Ramaurthi, 4,678,499, Cl. 71-90.000.
Petersen, Wallace C., 4,678,497, Cl. 71-86.000.
Reitz, Robert R., 4,678,607, Cl. 252-609.000.
Rudershausen, Charles G., 4,678,859, Cl. 570-163.000.
Walter, Henry C., 4,678,848, Cl. 526-220.000.
Wilhite, Douglas L.; and Mickewich, Daniel J., 4,678,744, Cl. 430-569.000.

Dupre, Jean; and Keenan, Andrea C., to Rohm and Haas Company. Rinse aid formulation. 4,678,596, Cl. 252-174.240.

Durbin, James W., to Canevari Timber Co., Inc. Method and system for determination of data record order based on keyfield values. 4,679,139, Cl. 364-200.000.

Dureanleau, Roger G.; and Knifton, John F., to Texaco Inc. Process for separation of product resulting from hydroformylation. 4,678,857, Cl. 568-454.000.

Durst Phototechnik GmbH: *See—*
Reiterer, Walther, 4,678,319, Cl. 355-38.000.

Dusch, Albert; and Willenbacher, Erich, to Pfaff Industrie Maschinen GmbH. Positioning device for sewing machine main shaft. 4,677,926, Cl. 112-274.000.

Dusterhoft, Ernest E.: *See—*
Ban, Thomas R.; Dusterhoft, Ernest E.; and Gilmore, John E., 4,678,365, Cl. 404-118.000.

Dutartre, Didier: *See—*
Haond, Michel; Bensahel, Daniel; and Dutartre, Didier, 4,678,538, Cl. 156-643.000.

Dyakov, Vladimir A.: *See—*
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.

Dyckerhoff Engineering GmbH: *See—*
Deyhle, Henning; and Grisar, Alexaner, 4,678,514, Cl. 106-100.000.

Dynapert-HTC Corporation: *See—*
Derrico, Gerard G., 4,678,111, Cl. 228-37.000.

Dzus Fastener Co. Inc.: *See—*
Wright, Andrew C. W., 4,677,714, Cl. 24-590.000.

E.C.C. America Inc.: *See—*
Dunaway, Weyman H., 4,678,517, Cl. 106-309.000.

E. H. Wachs Company, The: *See—*
Kwech, Horst; and Olson, Peter K., 4,677,884, Cl. 82-4.00C.

E.I. du Pont de Nemours and Company: *See—*
Lee, Denny L. Y., 4,679,142, Cl. 364-406.000.

E-Z-EM, Inc.: *See—*
Onik, Gary; and Ginsburg, Leonard, 4,678,459, Cl. 604-22.000.

Eady, Robert W.: *See—*
Davis, Aurthur A.; and Eady, Robert W., 4,679,250, Cl. 455-601.000.

Earwood, Donald E., Sr. Telephone cord twist restrainer. 4,679,234, Cl. 379-438.000.

Easter, John H.: *See—*
Blandford, David M.; and Easter, John H., 4,678,031, Cl. 166-242.000.

Eastlund, Bernard J.; Schmitt, Kenneth J.; and Bass, Ronald M., to Formation Damage Removal Corporation. Well heater. 4,678,034, Cl. 166-248.000.

Eastman Kodak Company: *See—*
Beach, David E., 4,678,300, Cl. 354-21.000.
Harvey, Donald M., 4,678,299, Cl. 354-21.000.
Malloy Desormeaux, Stephen G., 4,678,303, Cl. 354-173.110.

Eastman, Richard E.; and Williams, Randolph C., to Chrysler Motors Corporation. Transfer case with inter-axle dual-planetary differential. 4,677,873, Cl. 74-665.0GE.

Eaton Corporation: *See—*
Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.
Hicks, Loy A., Jr.; Sherwood, Edward P.; and Saks, Thomas J., 4,678,253, Cl. 439-210.000.
Kenway, Sidney, 4,678,879, Cl. 200-295.000.
Light, Gerard M., 4,678,070, Cl. 192-58.00B.
Mahon, Joseph J., 4,678,930, Cl. 307-141.000.
Schultz, Gary R., 4,678,017, Cl. 152-416.000.

Eberhardt, Horst: *See—*
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Ebi, Yutaka: *See—*
Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.

Eccardt, Curtis J., to Emerson Electric Co. Adjustable side extensions for work table. 4,677,920, Cl. 108-69.000.

Eccles, Robert E.: *See—*
Vasseghi, Nader; Goddard, Donald G.; and Eccles, Robert E., 4,678,940, Cl. 307-446.000.

Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., to ALZA Corporation. Dispenser comprising capsule with volume displacing member. 4,678,467, Cl. 604-892.000.

Eckle, Otto, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Machine tool spindle and tool holders suitable for use therewith. 4,678,382, Cl. 409-232.000.

Ecklund, Lawrence M., to Motorola, Inc. Correction control circuit for AM stereophonic receivers. 4,679,237, Cl. 381-15.000.

Ed. Zublin Aktiengesellschaft: *See—*
Beitinger, Eberhard; and Glaser, Eberhard, 4,678,771, Cl. 502-402.000.

Glaser, Eberhard, 4,678,369, Cl. 405-129.000.

Edakubo, Hiroo, to Canon Kabushiki Kaisha. Information signal reproducing apparatus. 4,679,099, Cl. 360-10.200.

Eder, Kenneth C.; and Krzyanowski, Robert V., to Honeywell Inc. Ultrasonic distance sensor with dual burst noise rejection. 4,679,175, Cl. 367-98.000.

Edgar, Brian W.; and Elliott, Robert B., to University of Auckland, The. Method of dispensing and/or a dispenser. 4,677,975, Cl. 128-200.140.

Edwards, David V.; and Newman, Michael A., to RFD Limited. Inflatable liferaft. 4,678,443, Cl. 441-38.000.

Edwards, Thomas P.: *See*—
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.

Edwards, William B.; and Hamlin, Thomas J., to Xerox Corporation. Copying machine with a rotary sorter having sheet gripping devices. 4,678,179, Cl. 271-295.000.

EEE Corporation: *See*—
Shuman, Bernard E., 4,677,780, Cl. 40-600.000.

Egawa, Hideharu; and Okumura, Katsuya, to Kabushiki Kaisha Toshiba. Method of wire bonding with applied insulative coating. 4,678,114, Cl. 228-176.000.

Eggers, Mark L., to KW Battery Company. Tubular plate electrode slurry filling process and apparatus for lead-acid cells. 4,678,730, Cl. 429-140.000.

EIC Laboratories, Inc.: *See*—
Robblee, Lois S., 4,677,989, Cl. 128-784.000.

Eichenberger, Hansulrich; Lacher, Ludwig; and Schmid, Titus, to Maschinenfabrik Rieter A.G. Arrangement for cleaning the pressing rollers of a combing machine. 4,677,710, Cl. 19-218.000.

Eidenschink, Rudolf: *See*—
Kreuzer, Franz-Heinrich; Eidenschink, Rudolf; and Weber, Georg, 4,678,283, Cl. 350-340.000.

Einolf, Charles W., Jr.: *See*—
Koch, Karl C.; and Einolf, Charles W., Jr., 4,679,111, Cl. 361-31.000.

Ekika Carbon Dioxide Co., Ltd.: *See*—
Hamano, Masanori; Takeuchi, Siro; and Inoue, Ichiro, 4,678,640, Cl. 422-56.000.

Electric Power Research Institute, Inc.: *See*—
Coffin, Louis F., Jr.; and Prater, Thomas A., 4,677,855, Cl. 73-799.000.

Electricity Council, The: *See*—
Griffith, John T., 4,678,881, Cl. 219-10.510.

Electrohome Limited: *See*—
Kurz, Walter, 4,679,211, Cl. 315-399.000.

Elevator GmbH: *See*—
Roschier, Nils-Robert, 4,679,032, Cl. 340-562.000.

Elfline, Geraldine S., to CX/OXYTECH, Inc. Method of removing heavy metal from wastewater streams. 4,678,584, Cl. 210-719.000.

Elfman, Brian P.; and Zajac, Patricia L., to Autosense Corporation. Breath alcohol analyzer. 4,678,057, Cl. 180-272.000.

Elkem a/s: *See*—
Dahl, Erik Q.; Vatland, Arnfinn; and Vegge, Olaf T., 4,678,434, Cl. 432-242.000.

Elliott, Brian W., to Dow Chemical Company, The. Curable coating composition and epoxy resin adduct useful therein. 4,678,712, Cl. 428-418.000.

Elliott, James O.; and Monahan, Michael B., to General Motors Corporation. Sensorless starting control for a brushless DC motor. 4,678,973, Cl. 318-254.000.

Elliott, Robert B.: *See*—
Edgar, Brian W.; and Elliott, Robert B., 4,677,975, Cl. 128-200.140.

Ellison, John R., Jr.: *See*—
Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., 4,679,029, Cl. 340-347.00P.

Ellison, Kenneth, to Hunter Engineering (Canada) Ltd. Oven system having a heated snout at its entrance end. 4,678,433, Cl. 432-59.000.

Ellison, Thomas M.: *See*—
Palmer, Emery A.; Shimanski, Michael A.; Ellison, Thomas M.; and Everidge, Jack P., 4,678,690, Cl. 428-31.000.

Elm Company Ltd.: *See*—
Hori, Keiichi, 4,679,058, Cl. 346-140.00R.

Elmore, Jimmy D.; and Goff, Elizabeth S., to Celanese Corporation. Process for the ammonium hydroxide hydrolysis of polymers of acetoxystyrene to polymers of vinylphenol. 4,678,843, Cl. 525-378.000.

Eloranta, Jarmo, to Rauma-Repola Oy. Mode of construction of lifting mechanisms for a jack-up platform and lifting mechanism for a jack-up platform. 4,678,165, Cl. 254-97.000.

Elston, Thomas P., to G S I Holdings (Proprietary) Limited. Nozzle. 4,678,125, Cl. 239-589.100.

ELTAC Nogler & Daum KG: *See*—
Oppitz, Hans, 4,678,554, Cl. 204-299.00R.

Emelyanov, Viktor A.: *See*—
Gluschenko, Nikolai N.; Golikov, Vladislav V.; and Emelyanov, Viktor A., 4,677,864, Cl. 73-863.510.

Emerson Electric Co.: *See*—
Eccardt, Curtis J., 4,677,920, Cl. 108-69.000.

Emhart Industries, Inc.: *See*—
Foster, Thomas V., 4,678,492, Cl. 65-74.000.
Nebelung, Hermann H.; and Knoth, Werner-Dieter, 4,678,494, Cl. 65-261.000.
Shedigian, Vandos, 4,679,119, Cl. 361-315.000.
Williams, Reade; and Westlund, Kenneth P., 4,679,075, Cl. 358-106.000.

Emmer, Eric D., to Chrysler Motors Corporation. Tapered piston pin. 4,677,722, Cl. 29-156.50A.

Emmerich, Kenneth C., to Fansteel Inc. Coolant sleeve for mining tools. 4,678,238, Cl. 299-81.000.

Endo, Akira: *See*—
Tsujii, Fumio; Matsuoka, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, 4,679,147, Cl. 364-449.000.

Energy Conversion Devices, Inc.: *See*—
Boer, Willem D.; and Kawasaki, Atsushi, 4,678,542, Cl. 156-659.100.
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,677,738, Cl. 29-572.000.
Johnson, Robert R., 4,677,742, Cl. 29-591.000.
Johnson, Robert R.; and Chapelle, Walter E., 4,679,085, Cl. 358-160.000.
Ovshinsky, Stanford R., 4,678,679, Cl. 427-38.000.

Energy Development Associates, Inc.: *See*—
Bjorkman, Harry K., Jr.; and Carr, Peter, 4,678,656, Cl. 423-500.000.

Engel, Gunter: *See*—
Mang, Hermenegild; and Engel, Gunter, 4,678,535, Cl. 156-623.00R.

Engelhard Corporation: *See*—
Wan, Chung-Zong; Dettling, Joseph C.; and Jagel, Kenneth I., 4,678,770, Cl. 502-304.000.

Engels, Joachim, to Hoechst Aktiengesellschaft. Process for the preparation of corticosteroid-21-phosphoric acids and their salts and the corticosteroid-21-phosphoric acid triesters. 4,678,609, Cl. 260-397.450.

Engineering & Research Associates: *See*—
Gummere, John B.; and Minney, Stephen C., 4,678,049, Cl. 177-229.000.

Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, to Voest-Alpine Aktiengesellschaft. Tilting channel arrangement for guiding a molten material. 4,678,168, Cl. 266-196.000.

Enkner, Bernhard; Stephani, Dietmar; Schropp, Leopold; and Stastny, Wilhelm, to Voest-Alpine Aktiengesellschaft. Arrangement for the production of vitrified slag. 4,678,419, Cl. 425-143.000.

Ennis, James F., III, to Anderson, Mark L. Dripless dispenser for liquids and viscous fluids. 4,678,107, Cl. 222-386.500.

Enomoto, Takamichi: *See*—
Ohta, Wasaburo; Enomoto, Takamichi; and Uehara, Kiyohiro, 4,678,285, Cl. 350-345.000.

Enron Corp.: *See*—
Lisowyj, Bohdan; Hitchcock, David C.; and Epstein, Henry, 4,678,647, Cl. 423-96.000.

Environmental Tectonics Corporation: *See*—
Melrose, Richard C.; and McIntosh, Lionel D., 4,678,914, Cl. 250-343.000.

Enzo-Gutzeit OY: *See*—
Niiranen, Tapani; Savolainen, Erkki; and Kohonen, Raimo, 4,678,574, Cl. 210-327.000.

Eotec Corporation: *See*—
Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., 4,679,029, Cl. 340-347.00P.

Epstein, David I.; and Holland, Charles J., to Data General Corporation. Microsequencer in a data processing system using stack storage for controlling the sequencing of microroutines. 4,679,138, Cl. 364-200.000.

Epstein, Henry: *See*—
Lisowyj, Bohdan; Hitchcock, David C.; and Epstein, Henry, 4,678,647, Cl. 423-96.000.

Erbele, Kurt: *See*—
Schomers, Josef; Erbele, Kurt; and Bonk, Wernfried, 4,679,121, Cl. 361-413.000.

Erben, Ralf; and Walden, Michael F. M., to Lucas Industries Public Limited Company. Brake actuator. 4,678,065, Cl. 188-196.00D.

Erbes, Kurt: *See*—
Schneller, Arnold; Herwig, Walter; and Erbes, Kurt, 4,678,737, Cl. 430-270.000.

ERCO Industries Limited: *See*—
Twardowski, Zbigniew, 4,678,655, Cl. 423-478.000.

Erdelitsch, Herbert; and Hecht, Walter, to WSWF Auto-Electric GmbH. Steering column switch for motor vehicles. 4,678,875, Cl. 200-61.540.

Ergene, Serdar: *See*—
Fetter, John L.; Evans, Jerald R.; and Ergene, Serdar, 4,679,041, Cl. 340-747.000.

Erhardt, Harry G., to RCA Corporation. CCD circuitry for line-sequential read out of a photosensor array. 4,679,090, Cl. 358-213.260.

Erhardt, Manfred: *See*—
Loos, Herbert; and Erhardt, Manfred, 4,677,962, Cl. 125-11.0CD.

Erickson, Paul M.: *See*—
Wilson, Timothy J.; and Erickson, Paul M., 4,679,028, Cl. 340-347.0CC.

Erikson, J. Alden: *See*—
Chang, Wen-Hsuan; Dufford, Edward L.; Erikson, J. Alden; and Prucnal, Paul J., 4,678,835, Cl. 525-100.000.

Ernst, Hans-Otto; and Jakobsmeyer, Helmut, to Hella KG Hueck & Co. Headlight for motor vehicles. 4,679,127, Cl. 362-294.000.

Eroskey, Richard E.; and Miller, Larry G., to B. F. Goodrich Company, The. Method of making liner sections for rotary pulverizers. 4,678,530, Cl. 156-245.000.

Erthel, Mira: *See*—
Bulst, Wolf-Eckhart; Erthel, Mira; and Zibis, Peter, 4,679,014, Cl. 333-195.000.

Escaravage, Gerard, to Aciers et Outillage Peugeot. Buckle, especially for a safety belt. 4,677,715, Cl. 24-637.000.

Eskandry, Ezra D.: *See*—
Pfaff, Paul H.; Spagna, Richard N.; Clucas, Robert A.; Coulson, Paul; and Eskandry, Ezra D., 4,679,035, Cl. 340-572.000.

Esposito, Chris, to Four Season Solar Products Corporation. Guide element especially suitable for solar greenhouses and the like and particularly utilizable for controlled shading. 4,678,019, Cl. 160-272.000.

Etablissements Poirier S.A.: *See*—
Chabrol, Jean-Jacques; and Lambert, Jean-Pierre, 4,678,233, Cl. 297-429.000.

Etat Francais Represente Par le Minitre des Ptt, Centre National d'Etudes des Telecommunications: *See*—
Haond, Michel; Bensahel, Daniel; and Dutartre, Didier, 4,678,538, Cl. 156-643.000.

Eur-Control Kalle AB: *See*—
Lundberg, Peter, 4,677,846, Cl. 73-63.000.

Evans, James D.: *See*—
Nelson, Richard D.; and Evans, James D., 4,678,452, Cl. 464-38.000.

Evans, Jerald R.: *See*—
Fetter, John L.; Evans, Jerald R.; and Ergene, Serdar, 4,679,041, Cl. 340-747.000.

Evans, Terence M.: *See*—
Holmes, Robert T.; Evans, Terence M.; King, Keith; and Graiff, Leonard B., 4,678,479, Cl. 44-57.000.

Everidge, Jack P.: *See*—
Palmer, Emery A.; Shimanski, Michael A.; Ellison, Thomas M.; and Everidge, Jack P., 4,678,690, Cl. 428-31.000.

Ewald, Henry J.: *See*—
Vrabel, Robert J.; Vajgart, Jeffery L.; Staszel, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.

Ewing, Joseph. Handicap turn signal bar for an automobile. 4,677,932, Cl. 116-35.00R.

Extraversion, Inc.: *See*—
Ytter, Willy, 4,678,246, Cl. 312-114.000.

Exxon Production Research Co.: *See*—
Ortloff, John E., 4,677,930, Cl. 114-230.000.

Exxon Research and Engineering Company: *See*—
Wernick, David L., 4,678,555, Cl. 208-36.000.

Fahlbusch, Dieter: *See*—
Knakowski, Rolf; and Fahlbusch, Dieter, 4,679,026, Cl. 340-63.000.

Fahnestock, E. Carl. Quick music notes slide rule. 4,677,893, Cl. 84-473.000.

Fairchild Filter Corporation: *See*—
Moorehead, Jack F.; and Campbell, Richard S., Sr., 4,678,564, Cl. 210-108.000.

Fairchild Medical Systems, Inc.: *See*—
Fairchild, Richard A., 4,679,217, Cl. 378-97.000.

Fairchild, Richard A., to Fairchild Medical Systems, Inc. X-ray cassette structure. 4,679,217, Cl. 378-97.000.

Faltin, Hans G., to Custom-Bilt Machinery, Inc. High speed on-line reshingling of printed products. 4,678,172, Cl. 270-18.000.

Fansteel Inc.: *See*—
Emmerich, Kenneth C., 4,678,238, Cl. 299-81.000.

Fanuc Ltd.: *See*—
Yamazaki, Etuo; and Yamaguchi, Masashi, 4,679,159, Cl. 364-560.000.

Fanuc Ltd: *See*—
Obara, Haruki; Ito, Masaya; and Tonamura, Masashi, 4,678,884, Cl. 219-69.00P.

Farace, Louis P., to Motorola, Inc. Safe and arming device. 4,677,913, Cl. 102-215.000.

Farfor, James D.: *See*—
Debenham, Michael; and Farfor, James D., 4,677,757, Cl. 34-4.000.

Farrar, John C.; Ney, Reuben E.; and Schroeder, James L., III, to AMP Incorporated. Filtered electrical connector. 4,679,013, Cl. 333-182.000.

Feijen, Jan; and Hennink, Wilhelmus E., to Cordis Europa N.V. Conjugates of anticoagulant and protein. 4,678,671, Cl. 424-443.000.

Fekkes, Wilhelmus F.: *See*—
Schmitz, Herman J. R.; Annegarn, Marcellinus J. J. C.; and Fekkes, Wilhelmus F., 4,679,083, Cl. 358-147.000.

Feldmann, Joachim, to WABCO Westinghouse Fahrzeugbremsen GmbH. Fastener arrangement for deformation sensor. 4,677,857, Cl. 73-855.000.

Fellows, Adrian N., to Fibre Treatments (Holding) Limited. Impregnated substrate incorporating an indicator dye. 4,678,704, Cl. 428-289.000.

Fellows, Oscar L. Thermomotor. 4,677,825, Cl. 60-525.000.

Fender Musical Instruments Corporation: *See*—
Gressett, Charles A., Jr.; Page, John F.; Smith, Daniel J.; and Carruthers, John, 4,677,891, Cl. 84-313.000.

Ferag AG: *See*—
Reist, Walter, 4,678,174, Cl. 270-54.000.

Ferber, Alan C.; and Chamran, Morteza M., deceased (by Chamran, Delories M., executrix), to Perkin-Elmer Corp. Wide dynamic range linear to log converter with microcomputer control. 4,679,162, Cl. 364-571.000.

Ferguson, Donald C.: *See*—
Smith, Merrill M.; and Ferguson, Donald C., 4,678,528, Cl. 156-220.000.

Ferguson, Robert G.: *See*—
Anderson, Andrew G.; Bullen, David A.; and Ferguson, Robert G., 4,677,877, Cl. 74-785.000.

Ferragamo, Mark: *See*—
Jordan, Mark T.; and Ferragamo, Mark, 4,678,061, Cl. 182-206.000.

Ferrari, Harry M., to Westinghouse Electric Corp. Nuclear fuel assembly grid with predetermined grain orientation. 4,678,632, Cl. 376-462.000.

Fetter, John L.; Evans, Jerald R.; and Ergene, Serdar, to Sun Microsystems, Inc. High speed Z-buffer with dynamic random access memory. 4,679,041, Cl. 340-747.000.

Fetzer, Wolfgang, to Svenska Rotor Maskiner Aktiebolag. Apparatus for catalytic cleaning of exhaust gases from a furnace system. 4,678,643, Cl. 422-175.000.

F'Geppert, Erwin. Prevention of particulate accumulations on observation windows in military vehicles. 4,678,224, Cl. 296-91.000.

Fiat Auto S.p.A.: *See*—
Castagno, Aldo, 4,678,227, Cl. 296-213.000.

Fibre Treatments (Holding) Limited: *See*—
Fellows, Adrian N., 4,678,704, Cl. 428-289.000.

Fieldcrest Cannon, Inc.: *See*—
Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., 4,678,173, Cl. 270-45.000.

Filkins, Timothy J., to Chrysler Motors Corporation. Transmission vibration viscous damper. 4,677,868, Cl. 74-359.000.

Filliman, Paul D., to RCA Corporation. Regulating power supply for video display apparatus. 4,679,131, Cl. 363-21.000.

Fillmore, William E., to Owens-Illinois, Inc. Vacuum indicating thermoplastic closure. 4,678,082, Cl. 206-459.000.

Finch, Stephen C.: *See*—
Ponsford, Roger J.; Pearson, Michael J.; and Finch, Stephen C., 4,678,782, Cl. 514-210.000.

Finger, John F.; and Lawrenson, Glen A., to Sioux Steam Cleaner Corporation. Combination cleaner safety circuit. 4,678,892, Cl. 219-272.000.

Fink, Ludwig; and Toussaint, Hans-Norbert, to Siemens Aktiengesellschaft. Optical fiber plug device including fiber for monitoring a light source. 4,678,265, Cl. 350-96.200.

Finkel, Joel R.; Jacobs, Paul F.; Gustafson, Kenneth I.; and Green, William D., to Xerox Corporation. Method and apparatus for the prevention of unauthorized copying of documents. 4,678,322, Cl. 355-133.000.

Finley, Martha N.; and Spector, George. Vacuum cleaner exhaust dust collector. 4,678,485, Cl. 55-255.000.

Finn, Roger C.; and MacKenzie, Morley S., to Northern Telecom Limited. Optical fiber splice. 4,678,272, Cl. 350-96.210.

Finnell, James S., to Hewlett-Packard Company. Apparatus for locating a memory module within a memory space. 4,679,167, Cl. 364-900.000.

Fischer, Glenn N. Guided-bend test apparatus. 4,677,856, Cl. 73-850.000.

Fischer, Walter: *See*—
Matthews, Thomas A.; Fischer, Walter; and Petzwinkler, Lucas, 4,678,068, Cl. 188-353.000.

Fisher, Robert J., to Magna International Inc. Memory positioning system for remote control rear-view mirror. 4,678,295, Cl. 350-634.000.

Fishman, Herbert; and Rogers, Alvin J., to Systems Engineering & Manufacturing Corp. Printed circuit board holder. 4,678,169, Cl. 269-46.000.

Fitzgerald, Thomas J.: *See*—
Rudy, Richard M.; and Fitzgerald, Thomas J., 4,678,403, Cl. 417-12.000.

Flanders Filters, Inc.: *See*—
Cadwell, George H., Jr.; Pittman, Clarence B.; and Bowers, Cecil W., 4,678,487, Cl. 55-385.00A.

Fletcher, Mark G.: *See*—
Bollin, Ernest, Jr.; and Fletcher, Mark G., 4,678,812, Cl. 514-777.000.

Flitton, James F., to Photo-Me International PCL. Photographic camera. 4,678,305, Cl. 354-203.000.

Flores, David P.: *See*—
McKinney, Osborne K.; Allen, James A.; and Flores, David P., 4,678,836, Cl. 525-221.000.

Flores, Robert J., to PMC Specialties Group, Inc. Process for the purification of triphenylmethane compounds. 4,678,613, Cl. 260-391.000.

Flory, Thomas A., to Monsanto Company. Multi-size tire chuck. 4,677,848, Cl. 73-146.000.

Flum, Paul, to Paul Flum Ideas, Inc. Collapsible display and storage container. 4,678,088, Cl. 211-73.000.

Fock, Jurgen; and Rott, Hans, to TH. Goldschmidt AG. Use of copolymers of polyoxyalkylene ethers of allyl and/or methallyl alcohol and vinyl esters as demulsifiers for water-containing crude oil. 4,678,599, Cl. 252-343.000.

Focke and Co.: *See*—
Focke, Heinz; and Mutschall, Hugo, 4,678,074, Cl. 198-457.000.

Focke & Co., (GmbH & Co.): *See*—
Focke, Heinz; and Mutschall, Hugo, 4,678,901, Cl. 250-223.00R.

Focke, Heinz; and Mutschall, Hugo, to Focke and Co. Apparatus for separating objects (packages) from a continuous row of objects. 4,678,074, Cl. 198-457.000.

Focke, Heinz; and Mutschall, Hugo, to Focke & Co., (GmbH & Co.). Optical sensor for monitoring cigarette groups. 4,678,901, Cl. 250-223.00R.

Fonda, Carlo L., to Videocolor. Shadow mask for a colored image tube and image tube comprising the same. 4,678,963, Cl. 313-405.000.

Fondiller, Robert. Apparatus for the construction of a low cost structure. 4,678,157, Cl. 249-65.000.

Fong, Dodd W.; and Kowalski, David J., to Nalco Chemical Company. Phosphonic acid-containing polymer. 4,678,840, Cl. 525-340.000.

Ford Motor Company: *See—*
Cairns, Thomas M., 4,677,702, Cl. 7-107.000.
Dick, Heinz, 4,679,125, Cl. 362-66.000.
Hamburg, Douglas R., 4,677,956, Cl. 123-520.000.
Ransom, Keith C.; and Howitt, Henry G., 4,678,007, Cl. 137-625.660.
Tamagne, Henry J., 4,677,946, Cl. 123-146.50A.
Vrabel, Robert J.; Vajgart, Jeffery L.; Staszel, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.

Formation Damage Removal Corporation: *See—*
Eastlund, Bernard J.; Schmitt, Kenneth J.; and Bass, Ronald M., 4,678,034, Cl. 166-248.000.

Foster, Thomas V., to Emhart Industries, Inc. Blowing process for expanding a molten glass parison. 4,678,492, Cl. 65-74.000.

Fouassier, Jean-Pierre. Modular device for storing compact discs or the like. 4,678,245, Cl. 312-15.000.

Four Season Solar Products Corporation: *See—*
Esposito, Chris, 4,678,019, Cl. 160-272.000.

Fowler, George A.; Hamilton, James M.; and Whiteway, William J., to Canadian Patents and Development Limited. Traction device for line handling equipment. 4,678,132, Cl. 242-47.090.

Francescon, Paul K.: *See—*
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,678,040, Cl. 166-370.000.

Frank, Dieter: *See—*
Brady, Cathereine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, 4,678,580, Cl. 210-490.000.

Frank, Marc. Small animal trap with multifingered bait holder. 4,677,786, Cl. 43-82.000.

Franke, Heinrich: *See—*
Franke, Helga; Franke, Heinrich; Kruger, Hans-Rudolf; and Joppien, Hartmut, 4,678,811, Cl. 514-721.000.

Franke, Helga; Franke, Heinrich; Kruger, Hans-Rudolf; and Joppien, Hartmut, to Schering Aktiengesellschaft. Substituted benzylethers, pesticides containing these compounds and method for their preparation. 4,678,811, Cl. 514-721.000.

Frazer-Nash Ltd.: *See—*
Griffin, Dennis, 4,678,143, Cl. 244-63.000.

Fredeking, Terry M. Method for avoiding mistakes during plasmapheresis. 4,678,458, Cl. 604-6.000.

Fredricks, Cheryl A.: *See—*
Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.

Freeman, Thomas R., to Westinghouse Electric Corp. Nuclear reactor control rod cluster for enthalpy rise compensation. 4,678,628, Cl. 376-333.000.

Fremont Special Machine Co., Inc.: *See—*
Simonton, R. D.; Cattano, John D.; and Mason, Robert K., 4,678,729, Cl. 429-129.000.

Frick Company: *See—*
Pillis, Joseph W.; Murphy, David A.; Spellar, Peter C.; and Nemit, Paul, Jr., 4,678,406, Cl. 417-310.000.

Fried. Krupp GmbH: *See—*
Heidenreich, Peter; Heinen, Karl-Heinz; Muller, Wolfgang; and Veuhoff, Heinz, 4,679,205, Cl. 373-84.000.
Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,678,543, Cl. 202-154.000.

Friedrich, Karl, to Steyr-Daimler-Puch Aktiengesellschaft. Transmission, particularly for cross-country motor vehicles. 4,677,874, Cl. 74-665.0GC.

Friesen, Albert D.; and Grassler, Walter F., to Winnipeg Rh Institute Inc., The. Sight tube for monitoring of fluids. 4,678,278, Cl. 350-319.000.

Frisbie, William R.: *See—*
Cox, Michael W.; Levin, Richard I.; Cohen, David J.; and Frisbie, William R., 4,679,144, Cl. 364-417.000.

Fritzsche, Klaus, to Husky Injection Molding System Ltd. Automatic shut off nozzle for plastic extruder. 4,678,427, Cl. 425-562.000.

Frykhult, Rune H., to AB Celleco. Rotatable filter disc assembly. 4,678,575, Cl. 210-327.000.

Fuchizawa, Tetsuro: *See—*
Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Abe, Hisamasa, 4,678,742, Cl. 430-523.000.

Fuji Electric Co., Ltd.: *See—*
Kato, Toshiaki, 4,679,089, Cl. 358-213.190.

Fuji Photo Film Co., Ltd.: *See—*
Asai, Takamitsu; Akashi, Goro; Kitamoto, Tatsuji; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,678,682, Cl. 427-48.000.
Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masasi; and Tsukase, Masaaki, 4,678,735, Cl. 430-203.000.
Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.
Kurokawa, Toshio, 4,678,409, Cl. 417-420.000.
Miyoshi, Takahito; Fujiyama, Masaaki; Okutu, Toshimitu; Masuyama, Kenichi; and Nasu, Norio, 4,678,697, Cl. 428-141.000.
Nakanishi, Haruo; Sakaki, Hirokazu; Yamazaki, Toru; and Okishi, Yoshio, 4,678,551, Cl. 204-129.750.
Shiozawa, Etuo; Harada, Shigeo; Ohtsuka, Shuichi; and Ohnishi, Masahiro, 4,678,312, Cl. 355-3.00R.
Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Abe, Hisamasa, 4,678,742, Cl. 430-523.000.
Tamura, Kaoru; Yasuhiro, Kawai; and Utsumi, Isao, 4,678,180, Cl. 271-296.000.
Tokunaga, Fumihiro; Asai, Takamitsu; and Fujiyama, Masaaki, 4,678,706, Cl. 428-323.000.
Yamada, Kohzaburoh; Ichijima, Seiji; and Usui, Hideo, 4,678,743, Cl. 430-551.000.
Yamada, Sumito; and Okazaki, Masaki, 4,678,741, Cl. 430-445.000.
Yamada, Sumito; Mifune, Hiroyuki; and Urabe, Shigeharu, 4,678,745, Cl. 430-569.000.

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Inui, Toshiharu; and Moriguchi, Haruhiko, 4,679,055, Cl. 46-76.0PH.

Fujii, Yoshihal, to Sharp Kabushiki Kaisha. Copying machine. 4,678,320, Cl. 355-49.000.

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Sakimoto, Seiichiro; Fujita, Kazuo; Yamauchi, Yutaka; and Matsue, Hiroshi, 4,678,710, Cl. 428-407.000.

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Fukuda, Misao; Tsuda, Toshitaka; Murano, Kazuo; and Awata, Yutaka, 4,679,188, Cl. 370-29.000.
Hattori, Toshihiro; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,677,880, Cl. 74-866.000.
Kanai, Yasunori; and Saitoh, Taichi, 4,678,942, Cl. 307-455.000.
Nawata, Kazumasa; and Kanai, Yasunori, 4,678,935, Cl. 307-297.000.
Sugishima, Kenji; and Nakagawa, Kenji, 4,678,919, Cl. 250-491.100.
Takemae, Yoshihiro, 4,679,214, Cl. 377-80.000.

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Fujiyama, Masaaki: *See—*
Miyoshi, Takahito; Fujiyama, Masaaki; Okutu, Toshimitu; Masuyama, Kenichi; and Nasu, Norio, 4,678,697, Cl. 428-141.000.
Tokunaga, Fumihiro; Asai, Takamitsu; and Fujiyama, Masaaki, 4,678,706, Cl. 428-323.000.

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Hirano, Takahisa; Fukami, Shoji; and Maeda, Mitsutosho, 4,678,416, Cl. 418-55.000.

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Sugano, Takuo; Okabe, Yoichi; Miyake, Hideharu; and Fukaya, Naoki, 4,678,945, Cl. 307-476.000.

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Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.

Fukuoka, Yohei: *See—*
Mitsui, Osamu; and Fukuoka, Yohei, 4,678,861, Cl. 585-266.000.

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Fuller, Terry A., 4,678,274, Cl. 350-96.340.

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Funato, Hiroyoshi, to Ricoh Company, Ltd. Photo scanner device. 4,678,263, Cl. 350-3.710.

Furlong, James J.: *See—*
Butcher, William T.; Furlong, James J.; Howe, Dwayne E.; Snell, Gerald T.; and Yara, Calvin M., 4,679,117, Cl. 361-181.000.

Furukawa Aluminum Co., Ltd.: *See—*
Miyamoto, Mitsuya; Ooseki, Yasuyuki; and Nabae, Motohiro, 4,678,547, Cl. 204-37.100.

Furukawa, Junichi: *See*—
Yamamori, Takahiro; Takagi, Yasuo; and Furukawa, Junichi, 4,677,878, Cl. 74-861.000.

Furukawa, Tatsuya: *See*—
Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.

Furumai, Koro: *See*—
Tanaka, Eiichi; Furumai, Koro; and Kikutani, Fumitaka, 4,678,428, Cl. 431-76.000.

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Furuta, Mitsuo; and Uchida, Shinji, to Bridgestone Co., Ltd. Core of rubber crawler. 4,678,244, Cl. 305-57.000.

Furuya, Harumi, to Henry Mann, Inc. Apparatus for loose feeding of electrical components. 4,677,732, Cl. 29-563.000.

Fusi, Gaetano; and Meniconi, Silvio, to Sivep di Meniconi Giorgio & C.S.a.s. Paint spreader apparatus for the maintenance of installed poles, with paint ejector and spreading rollers. 4,677,935, Cl. 118-108.000.

Futamura, Kazumasa, to Toyota Jidosha Kabushiki Kaisha. Mechanical valve lifter construction adapted for mechanical/hydraulic valve lifter interchangability. 4,677,945, Cl. 123-90.480.

Futcher, Ralph J., to Valmet-Dominion Inc. Drier felting arrangement. 4,677,762, Cl. 34-114.000.

FXC Corporation: *See*—
Buehrer, Robert J.; and Gargano, William L. B., 4,678,145, Cl. 244-152.000.

G-C Dental Industrial Corp.: *See*—
Kondo, Kenji; Katsuyama, Shigeru; Akahane, Shoji; and Tomioka, Kentaro, 4,678,436, Cl. 433-228.100.

G S I Holdings (Proprietary) Limited: *See*—
Elston, Thomas P., 4,678,125, Cl. 239-589.100.

GA Technologies Inc.: *See*—
Hsu, Jang-Yu, 4,679,197, Cl. 372-2.000.

Gabelli, Antonio, to SKF Industrial Trading and Development Company B.V. Test device for producing a biaxial state of tension. 4,677,854, Cl. 73-794.000.

Gabor, Andrew; Dunfield, John C.; Bowers, George W., Jr.; and Crystal, Richard G., to Xerox Corporation. Print tip contact sensor for quiet impact printer. 4,678,355, Cl. 400-389.000.

Gabriel, Edwin Z. Shovel-like coupling devices with automatic material handling features. 4,678,220, Cl. 294-118.000.

Gagle, Duane W.; Gagle, Duane W., Jr.; Gagle, Richard L.; and Gomory, Paul L. Covering or liner system and method for constructing the same. 4,678,375, Cl. 405-270.000.

Gagle, Duane W., Jr.: *See*—
Gagle, Duane W.; Gagle, Duane W., Jr.; Gagle, Richard L.; and Gomory, Paul L., 4,678,375, Cl. 405-270.000.

Gagle, Richard L.: *See*—
Gagle, Duane W.; Gagle, Duane W., Jr.; Gagle, Richard L.; and Gomory, Paul L., 4,678,375, Cl. 405-270.000.

Galik, George M. Printed circuit board fine line plating. 4,678,545, Cl. 204-15.000.

Gall, John C., to Sears, Roebuck & Co. Inertia controlled loading system. 4,678,454, Cl. 474-101.000.

Gallo, Mario: *See*—
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Gallusser, David O.; Brush, Robert W., Sr.; and MacAvoy, David W., to Allied Corporation. EMI shielded electrical connector. 4,678,260, Cl. 439-607.000.

Galumbeck, Michael H. Firmness control device. 4,677,701, Cl. 5-447.000.

Gandhi, Hemant M.: *See*—
McCallum, Robert S.; Plasschaert, Paul E.; Landheer, Dolf; and Gandhi, Hemant M., 4,679,060, Cl. 346-159.000.

Gandy, Raymond C.: *See*—
Atkins, Kenneth E.; Gandy, Raymond C.; and Larck, William A., 4,678,711, Cl. 428-414.000.

Gardner, John F.; and Morton, Gerald H., to Xomox Corporation. Manually actuated fluid flow control valve and method of making same. 4,678,159, Cl. 251-107.000.

Gargano, William L. B.: *See*—
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Garland, Thomas N. Extendable writing instrument. 4,678,356, Cl. 401-95.000.

Garrett Corporation, The: *See*—
Dodge, John L.; Bush, Duane B.; Pechuzal, Georges A.; and Ravindranath, Ambrish, 4,678,398, Cl. 415-181.000.
Hardy, James A., 4,677,823, Cl. 60-274.000.

Gartner, Gunter: *See*—
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Gasparaitis, Bernard: *See*—
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Gates, Stillman E.: *See*—
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Gauckler, Ludwig: *See*—
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Gavin, John D., Jr.; and Meddaugh, Michael D., to Dow Corning Corporation. Method of constructing means for directing or holding water. 4,678,376, Cl. 405-270.000.

Gay, Don D.; and McMillan, William G., to United States of America, Energy. Sub-micron particle sampler apparatus. 4,677,863, Cl. 73-863.120.

Gayler, Robert J., to Piper FM Limited. Fuel delivery to internal combustion engines. 4,677,958, Cl. 123-585.000.

Gaz de France: *See*—
Henault, Jean-Paul; Drapier, Albert; Grochowski, Guy; and Meslif, Alain, 4,677,939, Cl. 122-17.000.

GBI International Industries, Inc.: *See*—
Lapsker, Itzchak, 4,677,793, Cl. 51-251.000.

Gebhard Balluff GmbH & Co.: *See*—
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Geddie, John D.: *See*—
Van Duyn, Paul D.; and Geddie, John D., 4,679,128, Cl. 362-306.000.

Geimuplast Peter Mundt GmbH. & Co. KG.: *See*—
Mundt, Peter; and Neuhold, Arnold, 4,678,525, Cl. 156-73.100.

Geke, Juergen; and Rutzen, Horst, to Henkel Kommanditgesellschaft auf aktien. Cationic surfactants based on quaternary ammonium compounds and methods of using same. 4,678,605, Cl. 252-547.000.

Gelfand, Valery A., to Western Geophysical Company of America. Method for seismic lithologic modeling. 4,679,174, Cl. 367-73.000.

Gelinas, William A.; and McDermott, Robert N., to Loctite Corporation. Variable flow rate dispensing valve assembly. 4,678,100, Cl. 222-52.000.

Genentech, Inc.: *See*—
Goeddel, David V., 4,678,751, Cl. 435-243.000.

General Dyanmics, Pomona Division: *See*—
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General Electric Company: *See*—
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Brown, Dale M., 4,677,736, Cl. 29-571.000.
Ciarcia, Ronald D.; DiVincenzo, Gregory T.; Bernier, Richard E.; and Nagy, Joseph G., 4,679,016, Cl. 335-132.000.
Germer, John H., 4,678,626, Cl. 376-298.000.
Hallgren, John E.; Policastro, Peter P.; Chao, Herbert S.; and Johnson, Bruce C., 4,678,839, Cl. 525-390.000.
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Kryder, Mark H.; and Shieh, Han-Ping D., 4,679,180, Cl. 369-13.000.
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Pasco, Wayne D.; and Arendt, Ronald H., 4,678,683, Cl. 427-123.000.
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,679,120, Cl. 361-358.000.
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Rowe, William S.; and Chao, Fred C., 4,678,622, Cl. 376-259.000.
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General Foods Corporation: *See*—
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Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,678,675, Cl. 426-548.000.

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Elliott, James O.; and Monahan, Michael B., 4,678,973, Cl. 318-254.000.
Iadipaolo, Rene M.; and Tkaczyk, Richard J., 4,678,920, Cl. 250-560.000.
Jandeska, William F., Jr.; and Rezhets, Vadim, 4,678,510, Cl. 75-244.000.
Lehnhoff, Richard N.; and Savage, Jack W., 4,678,972, Cl. 318-254.000.
Metzger, David B.; Johnson, Glenn S.; and Bramel, Michael D., 4,678,531, Cl. 156-250.000.
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General Research of Electronics, Inc.: *See*—
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Geophysical Company of Norway A.S.: *See—*
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George, William A.: *See—*
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Gergely, Gerhard; Gergely, Thomas; and Gergely, Irmgard. Effervescent composition and method of making same. 4,678,661, Cl. 424-44.000.

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Gergely, Gerhard; Gergely, Thomas; and Gergely, Irmgard, 4,678,661, Cl. 424-44.000.

Gergely, Thomas: *See—*
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Germer, John H., to General Electric Company. Radiant vessel auxiliary cooling system. 4,678,626, Cl. 376-298.000.

Gersbach, Klaus: *See—*
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Giardina, Nicholas: *See—*
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Gibbemeyer, Joseph F., to Cincinnati Milacron Inc. Resilient skirted spindle nose and pallet with reciprocatable spindle combined therewith. 4,678,425, Cl. 425-522.000.

Giddings, David M.; and Williamson, Charles D., to Nalco Chemical Company. Terpolymer composition for aqueous drilling fluids. 4,678,591, Cl. 252-8.514.

Giebeler, Eberhard; and Wilhelm, Gerhard, to Ruetgerswerke Aktiengesellschaft. Process for improving wood and use of the improved wood. 4,678,715, Cl. 428-537.100.

Gilmore, John E.: *See—*
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Glover, Alfred H.: *See—*
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Glover, Douglas W.: *See—*
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Gluschenko, Nikolai N.; Golikov, Vladislav V.; and Emelyanov, Viktor A., to Vsesojuzny Nauchno-Issledovatelsky I Konstruktorsky Institut Tsvetmetavtomatika. System for automatic sampling and sample conveyance for analysis. 4,677,864, Cl. 73-863.510.

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Goeddel, David V., to Genentech, Inc. Hybrid human leukocyte interferons. 4,678,751, Cl. 435-243.000.

Goehner, Robert D.; Glover, Norman I.; and Hensley, Donald G., to Simmonds Precision. Electro-impulse de-icing system for aircraft. 4,678,144, Cl. 244-134.00R.

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Goertz, Arnold E.: *See—*
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Gokyu, Toshio: *See—*
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Golden, Sanford S.: *See—*
Ryan, James M.; Golden, Sanford S.; and Sliker, Larry, 4,678,229, Cl. 297-68.000.

Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Goldman, Terry, to Penn Plax Plastics, Inc. Multi-use aquarium maintenance system. 4,678,568, Cl. 210-169.000.

Goldman, Marvin: *See—*
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Goldman, Winston W., to Sperry Corporation. Power as required beam deflection system for CRT displays with raster supply switching. 4,678,970, Cl. 315-397.000.

Goldschild, Pierre, to Schlumberger Technology Corporation. Methods and apparatus for subsurface testing of well bore fluids. 4,678,035, Cl. 166-250.000.

Golikov, Vladislav V.: *See—*
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Goodridge, Paul A.: *See—*
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Goodwin, Eber L., to AM International, Inc. Ink fountain preparation station and interchangeable ink fountain system. 4,677,912, Cl. 101-365.000.

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Goss, John: *See—*
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Gotou, Shizuo; Kagimasa, Toyohiko; Yoshizumi, Seiichi; and Shintani, Yooichi, to Hitachi, Ltd. Data processor with control of the significant bit lengths of general purpose registers. 4,679,140, Cl. 364-200.000.

Grace, James A.: *See—*
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Gradl, Reinhard; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for making an alkali phosphate solution. 4,678,650, Cl. 423-309.000.

Graham, Walker O.; and Pearson, William T. Cleaning and yarn conditioning system for weaving machines. 4,678,012, Cl. 139-1.00C.

Graiff, Leonard B.: *See—*
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Grams, Ralph R. Marine coating compositions and method. 4,678,512, Cl. 106-18.320.

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Grass Valley Group, Inc., The: *See—*
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Green, Carlos J.; Hirsius, John L.; and Book, Marshall K. Orthopedic heat transfer system for orthopedic casts. 4,677,970, Cl. 128-82.100.

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Green, William D.: *See—*
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Greene, Hilliard F., Sr., to Precision Screw Machine Company. Valve bridge construction method. 4,677,723, Cl. 29-157.10R.

Gregor, John A.: *See—*
Kritchevsky, Gina R.; Gregor, John A.; Gruendig, Manfred W.; Sellers, Gregory J.; and Liss, Barbara, 4,678,699, Cl. 428-175.000.

Gregory, Dieter, to Schemm, Theodor. Thermoplastic clamping ring. 4,678,216, Cl. 292-256.690.

Gressett, Charles A., Jr.; Page, John F.; Smith, Daniel J.; and Carruthers, John, to Fender Musical Instruments Corporation. Tremolo bridge for guitars. 4,677,891, Cl. 84-313.000.

Grey, Henry G.: *See*—
Herbert, William G., Jr.; Grey, Henry G.; and Reynolds, Bruce C., 4,678,691, Cl. 428-36.000.

Griffin, Beacher C. Safety cap for valve on high-pressure cylinder. 4,678,003, Cl. 137-382.000.

Griffin, Daniel V., to Whale Scientific, Inc. Disposable unitary cytology chamber and filter card for centrifugation of fluid samples and method of making same. 4,678,579, Cl. 210-477.000.

Griffin, Dennis, to Frazer-Nash Ltd. Launcher for remotely piloted aircraft. 4,678,143, Cl. 244-63.000.

Griffin, Graham J.: *See*—
Barnes, John R.; Diamond, John E.; and Griffin, Graham J., 4,678,147, Cl. 248-74.100.

Griffith, John T., to Electricity Council, The. Induction apparatus for heating and mixing a fluid. 4,678,881, Cl. 219-10.510.

Griffith, Ronald C.: *See*—
Napier, James J.; and Griffith, Ronald C., 4,678,791, Cl. 514-290.000.

Grigar, Larry L.: *See*—
Luke, Robert R.; Barker, James M.; Smith, Michael L.; Grigar, Larry L.; and Miller, Carl B., 4,678,044, Cl. 175-4.520.

Grisar, Alexaner: *See*—
Deyhle, Henning; and Grisar, Alexaner, 4,678,514, Cl. 106-100.000.

Grochowski, Guy: *See*—
Henault, Jean-Paul; Drapier, Albert; Grochowski, Guy; and Meslif, Alain, 4,677,939, Cl. 122-17.000.

Grocke, Diethelm. Dashboard lighting adjustment for a motor vehicle. 4,678,925, Cl. 307-10.0LS.

Grossinger, Israel, to Savin Corporation. Charge and bias control system for electrophotographic copier. 4,678,317, Cl. 355-14.00D.

Grossman, Mark W.; and George, William A., to GTE Products Corporation. Obtaining accurate amounts of mercury from mercury compounds via electrolytic methods. 4,678,550, Cl. 204-105.00R.

Groves, John P.: *See*—
Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.

Gruendig, Manfred W.: *See*—
Kritchevsky, Gina R.; Gregor, John A.; Gruendig, Manfred W.; Sellers, Gregory J.; and Liss, Barbara, 4,678,699, Cl. 428-175.000.

Grumman Aerospace Corporation: *See*—
Brandsetter, Robert W.; Schwarz, Jakob; and Seidon, Arnold, 4,679,048, Cl. 342-61.000.
Sarrantonio, August C., 4,678,141, Cl. 244-2.000.

Grundstedt, Peter; and Taube, Bill, to Hennix i Stockholm AB. Screen arrangement. 4,678,018, Cl. 160-135.000.

GTE Laboratories Incorporated: *See*—
Buhrer, Carl F., 4,678,287, Cl. 350-404.000.
Hsu, Shih C.; and Raman, Ramas V., 4,678,720, Cl. 428-606.000.
Olshansky, Robert, 4,679,199, Cl. 372-44.000.

GTE Products Corporation: *See*—
Bouchard, Andre C.; Thibault, Paul A.; and Lagushenko, Radomir I., 4,678,520, Cl. 148-6.350.
Grossman, Mark W.; and George, William A., 4,678,550, Cl. 204-105.00R.
Lester, James N., 4,678,968, Cl. 315-290.000.
Mager, Eric L., 4,678,966, Cl. 313-487.000.
Mizuhara, Howard, 4,678,636, Cl. 420-456.000.

Guastadini, Fausto. Pulsating current electromotor without commutator. 4,678,974, Cl. 318-254.000.

Gudas, Charles J., to Scholl, Inc. Shoe inlay. 4,677,766, Cl. 36-43.000.

Guerra, Romeo E. Igniter for gas discharge pipe with a flame detection system. 4,678,430, Cl. 431-202.000.

Guice, Walter L., to Vetco Offshore, Inc. Casing hanger. 4,678,209, Cl. 285-144.000.

Gummere, John B.; and Minney, Stephen C., to Engineering & Research Associates. Blood collection bag weight monitor. 4,678,049, Cl. 177-229.000.

Gunji, Kunihiko: *See*—
Okita, Masao; Gunji, Kunihiko; and Saito, Yukio, 4,679,106, Cl. 360-99.000.

Gunn, Duncan A.; Crownshaw, John C.; Davis, Arthur A.; and Colegate, Gilbert W. P., to Standard Telephones and Cables Public Limited Co. Submersible optical repeaters and optical fibre glands. 4,678,270, Cl. 350-96.200.

Gustafson, Kenneth I.: *See*—
Finkel, Joel R.; Jacobs, Paul F.; Gustafson, Kenneth I.; and Green, William D., 4,678,322, Cl. 355-133.000.

Gutman, Robert F., to United Techologies Automotive, Inc. Button set and switch. 4,678,872, Cl. 200-5.00R.

Gutschick, Vincent P.; Barron, Michael H.; Waechter, David A.; and Wolf, Michael A., to United States of America, Energy. Method and apparatus for measuring solar radiation in a vegetative canopy. 4,678,330, Cl. 356-222.000.

Gutte, Richard: *See*—
Pospich, Gunther; and Gutte, Richard, 4,678,832, Cl. 525-60.000.

Gyongyossy, Leslie L. Wedge type gate valves. 4,678,008, Cl. 137-630.120.

Haacke, E. Mark; and Bearden, Francis H., to Picker International, Inc. Magnetic resonance imaging method. 4,678,996, Cl. 324-309.000.

Haag, William G.: *See*—
Shortt, Alexandra B.; and Haag, William G., 4,678,778, Cl. 514-141.000.

Haarmann, Walter: *See*—
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.

Haddick, David H.: *See*—
Torrano, Michael A., Jr.; Lyon, George E.; and Haddick, David H., 4,679,087, Cl. 358-168.000.

Hafner, Udo; Hans, Waldemar; Kind, Wilhelm; Krauss, Rudolf; and Sauer, Rudolf, to Robert Bosch GmbH. Electromagnetically actuatable valve in particular a fuel injection valve. 4,678,124, Cl. 239-585.000.

Hagenbuch, LeRoy G. Apparatus for rotation of tailgate assembly. 4,678,235, Cl. 298-23.0DF.

Hagimoto, Kiyoshi: *See*—
Hirano, Takahisa; and Hagimoto, Kiyoshi, 4,678,415, Cl. 418-50.000.

Hagiwara, Takashi, to Sigma Enterprises, Inc. Control device for game machine. 4,679,143, Cl. 364-412.000.

Halczenko, Wasyl: *See*—
Baldwin, John J.; Halczenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., 4,678,806, Cl. 514-539.000.

Hales, Richard H.: *See*—
Cranney, Don H.; Gordon, David L.; and Hales, Richard H., 4,678,524, Cl. 149-21.000.

Hall, Timothy L. Machine and apparatus for making baskets. 4,678,016, Cl. 147-48.000.

Hallerback, Stig L., to Aktiebolaget SKF. Mounting tool. 4,677,725, Cl. 29-280.000.

Hallgren, John E.; Policastro, Peter P.; Chao, Herbert S.; and Johnson, Bruce C., to General Electric Company. Mixtures including polyphenylene ethers and lactams and resinous compositions prepared therefrom. 4,678,839, Cl. 525-390.000.

Halliburton Company: *See*—
Luke, Robert R.; Barker, James M.; Smith, Michael L.; Grigar, Larry L.; and Miller, Carl B., 4,678,044, Cl. 175-4.520.

Halstead, Raymond T.: *See*—
Black, Charles E., III; and Halstead, Raymond T., 4,678,249, Cl. 439-77.000.

Halton Oy: *See*—
Aalto, Erkki; and Yla-Hemmila, Veikko, 4,678,005, Cl. 137-499.000.

Ham, George E.; Chen, Wuu-Nan; and McIntyre, John M., to Dow Chemical Company, The. Electroconductive polymer-latex composites. 4,678,601, Cl. 252-500.000.

Hamada, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Laser recording apparatus. 4,679,057, Cl. 346-76.00L.

Hamamatsu Photonics Kabushiki Kaisha: *See*—
Hara, Tsutomu, 4,678,286, Cl. 350-356.000.

Hamano, Masanori; Takeuchi, Siro; and Inoue, Ichiro, to Ekika Carbon Dioxide Co., Ltd. Indicator for detecting residual ethylene oxide. 4,678,640, Cl. 422-56.000.

Hamburg, Douglas R., to Ford Motor Company. Solenoid duty cycle modulation for dynamic control of refueling vapor purge transient flow. 4,677,956, Cl. 123-520.000.

Hametta, Allen W., to Hi-Tech Systems, Corp. Electronic metal detector. 4,678,992, Cl. 324-208.000.

Hamilton, James M.: *See*—
Fowler, George A.; Hamilton, James M.; and Whiteway, William J., 4,678,132, Cl. 242-47.090.

Hamlin, Thomas J.: *See*—
Edwards, William B.; and Hamlin, Thomas J., 4,678,179, Cl. 271-295.000.

Hammill, Harry B., III: *See*—
Lukowski, Frank J., Jr.; and Hammill, Harry B., III, 4,678,329, Cl. 356-152.000.

Hanagan, Mary A.; and Thompson, Mark E., to Du Pont de Nemours, E. I., and Company. Herbicidal ortho-alkyl- and ortho-alkenyl-substituted benzenesulfonamides. 4,678,502, Cl. 71-93.000.

Hanamura, Eiichi; and Tokura, Yoshinori, to Mitsubishi Petrochemical Co., Ltd. Optical recording media on which information is stored and method of making same. 4,678,736, Cl. 430-270.000.

Handa, Tatuhiro, to Mazda Motor Corporation. Vehicle body assembly system. 4,678,110, Cl. 228-4.100.

Hankinson, Michael F.: *See*—
Malandra, Louis J.; Leduc, Robert J.; Hankinson, Michael F.; and Kowalski, Edward F., 4,678,623, Cl. 376-260.000.

Hans, Waldemar: *See*—
Hafner, Udo; Hans, Waldemar; Kind, Wilhelm; Krauss, Rudolf; and Sauer, Rudolf, 4,678,124, Cl. 239-585.000.

Hansel, Gernot: *See*—
Maier, Peter; and Hansel, Gernot, 4,677,750, Cl. 30-376.000.

Hansford, Christopher M.: *See*—
Bowyer, William H.; Crocker, Robert L.; Hansford, Christopher M.; Parker, Leslie K.; and Gray, Nigel, 4,678,194, Cl. 273-373.000.

Hanssler, Gerd: *See*—
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.

Haond, Michel; Bensahel, Daniel; and Dutartre, Didier, to Etat Francais Represente Par le Minitre des Ptt, Centre National d'Etudes des Telecommunications. Process for the production of an insulating support on an oriented monocrystalline silicon film with localized defects. 4,678,538, Cl. 156-643.000.

Haq, Mohammed E. U.: *See*—
Logwood, Dennis J.; Haq, Mohammed E. U.; Reed, John A.; and Karp, Joel A., 4,679,171, Cl. 365-154.000.

Hara, Masato; and Kaneko, Atsumi, to Ashai Optical Co., Ltd. Reference position-detecting device for photoelectric encoder. 4,678,910, Cl. 250-237.00G.

Hara, Tsutomu, to Hamamatsu Photonics Kabushiki Kaisha. Spatial light modulator. 4,678,286, Cl. 350-356.000.

Harada, Shigeo: *See*—
Shiozawa, Etuo; Harada, Shigeo; Ohtsuka, Shuichi; and Ohnishi, Masahiro, 4,678,312, Cl. 355-3.00R.

Harada, Susumu: *See*—
Ueda, Toshio; Kageno, Kenji; and Harada, Susumu, 4,678,474, Cl. 8-543.000.

Hardin, Roy T., Jr.: *See*—
Marshall, James R.; and Hardin, Roy T., Jr., 4,678,620, Cl. 376-203.000.

Hardy, James A., to Garrett Corporation, The. Diesel engine particulate trap regeneration system. 4,677,823, Cl. 60-274.000.

Harjunmaa, Hannu, to Labsystems Oy. Apparatus for the measurement of fluorescence, turbidity, luminescence or absorption. 4,678,326, Cl. 356-73.000.

Harnden, John D., Jr.; and Kornrumpf, William P., to General Electric Company. Piezoelectric ceramic switching devices and systems and methods of making the same. 4,678,957, Cl. 310-332.000.

Harris, James R.; and Harris, Leland H. Grain deflector for combines. 4,677,991, Cl. 130-27.0AE.

Harris, Leland H.: *See*—
Harris, James R.; and Harris, Leland H., 4,677,991, Cl. 130-27.0AE.

Harris, William B. Desiccant cartridge for fuel tank vent line. 4,677,929, Cl. 114-211.000.

Harry, Alan, to PA Consulting Services Limited. Ribbon cassettes and apparatus for receiving same. 4,678,139, Cl. 242-199.000.

Hartl, James C.: *See*—
Saaski, Elric W.; and Hartl, James C., 4,678,904, Cl. 250-227.000.

Hartman, George: *See*—
Baldwin, John J.; Halczenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., 4,678,806, Cl. 514-539.000.

Hartman, Kathy J.; and Shu, Winston R., to Mobil Oil Corporation. Miscible oil recovery process. 4,678,036, Cl. 166-273.000.

Hartmann, Wolfgang; and Gocht, Paul G., to Metallgesellschaft Aktiengesellschaft. Electrofilter. 4,678,484, Cl. 55-112.000.

Harvey, Donald M., to Eastman Kodak Company. Camera device for encoding conventional film cartridge. 4,678,299, Cl. 354-21.000.

Hasegawa, Masahiko; Naito, Yoshihiro; Tsunekawa, Masaru; and Momose, Yutaka, to Aisin Seiki Kabushiki Kaisha. Output control apparatus for Stirling engines. 4,677,824, Cl. 60-521.000.

Hashimoto, Kouji: *See*—
Takamatsu, Masayoshi; Hashimoto, Kouji; Manabe, Akiyoshi; and Ichihana, Hideyuki, 4,678,845, Cl. 525-462.000.

Hasson, David; and Karmon, Mordechai, to Technion Research & Development Foundation, Ltd.; and Mekoroth Water Co. Method for rapid controlled coating of the inner surfaces of pipes with a tenacious calcite lining. 4,678,685, Cl. 427-235.000.

Hastem-Muller, Hugo S. Slat conveyor belt for slat conveyor. 4,678,078, Cl. 198-803.200.

Hata, Ryozo: *See*—
Yasuoka, Junichi; Kamiyama, Sumio; Ashida, Kiyomi; and Hata, Ryozo, 4,678,511, Cl. 75-251.000.

Hatley, Gary L.: *See*—
Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., 4,678,173, Cl. 270-45.000.

Hatton, James H., Jr.: *See*—
Bronstad, Maurice E.; Hatton, James H., Jr.; and Meczkowski, Leonard C., 4,678,166, Cl. 256-13.100.

Hattori, Akihiko: *See*—
Tamenori, Hiroyuki; Hattori, Akihiko; and Yoshiyagawa, Mitsugi, 4,678,652, Cl. 423-339.000.

Hattori, Tadashi: *See*—
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,677,850, Cl. 73-204.000.
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, 4,678,921, Cl. 250-574.000.

Hattori, Toshihiro; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, to Isuzu Motors Limited; and Fujitsu Limited. Method of controlling automatic transmission in accordance with engine operation. 4,677,880, Cl. 74-866.000.

Hattori, Toshihiro: *See*—
Yoshimura, Hiroshi; and Hattori, Toshihiro, 4,678,069, Cl. 192-0.033.

Hatzakis, Michael; Liutkus, John J.; Paraszczszak, Jurij R.; and Shaw, Jane M., to International Business Machines Corp. Halogenated polystyrenes for electron beam, X-ray and photo resists. 4,678,850, Cl. 526-293.000.

Haunhorst, Greg A.: *See*—
Smith, Donald E.; and Haunhorst, Greg A., 4,678,219, Cl. 294-82.330.

Havig, Egil: *See*—
Stole, Kjell A.; Lovsland, Arnstien; and Havig, Egil, 4,678,560, Cl. 209-23.000.

Hawerkamp, Manfred. Method and apparatus for forming drain pipes. 4,678,526, Cl. 156-195.000.

Hay, James V.; and Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal 2,6-disubstituted benzylsulfonamides and benzenesulfamates. 4,678,500, Cl. 71-92.000.

Hay, Robert A.: *See*—
Agarwal, Anil K.; and Hay, Robert A., 4,678,762, Cl. 501-127.000.

Hayashi, Hiroo: *See*—
Miyamoto, Toshinobu; Hayashi, Hiroo; Sakurai, Hideya; Takabayashi, Hirofumi; and Ohnishi, Youichi, 4,679,022, Cl. 335-296.000.

Hayashi, Hiroshi: *See*—
Kobayashi, Osamu; Akagawa, Masaki; and Hayashi, Hiroshi, 4,678,072, Cl. 194-206.000.

Hayashi, Kimiyoshi, to Canon Kabushiki Kaisha. Color image reading apparatus with white balance system for controlling the intensity of a light source illuminating a color document. 4,679,073, Cl. 358-80.000.

Hayashi, Masatake, to Sony Corporation. Image pickup tube. 4,678,962, Cl. 313-383.000.

Hayashi, Motohide: *See*—
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.

Hayashi, Yoriyuki: *See*—
Fujinuma, Katsumi; Takase, Tsuneyoshi; and Hayashi, Yoriyuki, 4,677,976, Cl. 128-201.250.

Hayashi, Yoshiaki: *See*—
Ikedo, Masaru; Watari, Masafumi; Hayashi, Yoshiaki; Yamamoto, Osamu; and Tsutsu, Hiroshi, 4,678,275, Cl. 350-96.340.

Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,677,942, Cl. 123-41.210.

Hayashi, Yukichi; Itako, Eiji; and Yasuhara, Masahiro, to Kabushiki Kaisha Nipponcoinco. Automatic vending machine with discount function. 4,679,150, Cl. 364-479.000.

Hayes, Peter R., to BCIRA. Curing foundry moulds and cores. 4,678,020, Cl. 164-16.000.

Hayes, Starr R. Clean up glove. 4,677,697, Cl. 2-159.000.

Haygood, Norman M., Jr.: *See*—
Vrabel, Robert J.; Vajgart, Jeffery L.; Staszel, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.

HDS, Inc.: *See*—
Ditsch, John R.; Williams, Theodore G.; and Berrios, Luis H., 4,678,181, Cl. 272-68.000.

Heath Company: *See*—
Perdue, Terry A., 4,679,152, Cl. 364-513.000.

Hecht, Walter: *See*—
Erdelitsch, Herbert; and Hecht, Walter, 4,678,875, Cl. 200-61.540.

Heck, Samuel C., to Sani-Fresh International, Inc. Safety lock mechanism for cleaning wand. 4,678,105, Cl. 222-153.000.

Hehl, Karl. Vented cover assembly with filter insert for fluid reservoir. 4,678,572, Cl. 210-232.000.

Heide, Jorgen, to Richards Medical Company. Touch sensitive hearing aid volume control circuit. 4,679,240, Cl. 381-68.600.

Heidenreich, Peter; Heinen, Karl-Heinz; Muller, Wolfgang; and Veuhoff, Heinz, to Fried. Krupp GmbH. Tiltable metallurgical furnace vessel. 4,679,205, Cl. 373-84.000.

Heinen, Karl-Heinz: *See*—
Heidenreich, Peter; Heinen, Karl-Heinz; Muller, Wolfgang; and Veuhoff, Heinz, 4,679,205, Cl. 373-84.000.

Heinrich, Martin W.: *See*—
Bracht, Jeffrey L.; Heinrich, Martin W.; van Maaren, Richard D.; and Sleder, Richard L., 4,677,940, Cl. 123-2.000.

Heinrich, Peter; Knop, Klaus; and Rube, Friedbert, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Process for producing and using syngas and recovering methane enricher gas therefrom. 4,678,480, Cl. 48-197.00R.

Heintz, Robert J. Vibration dampener. 4,678,066, Cl. 188-218.00A.

Heist, Hans; Toepfer, Dieter; and Britzke, Sylvia, to Hoechst Aktiengesellschaft. Device for treating printing plates with a fluid. 4,678,310, Cl. 354-319.000.

Helene Curtis, Inc.: *See*—
Hoshowski, Myra A.; and Patel, Chaitanya, 4,678,475, Cl. 8-606.000.

Hella KG Hueck & Co.: *See*—
Ernst, Hans-Otto; and Jakobsmeyer, Helmut, 4,679,127, Cl. 362-294.000.

Hellekson, Ronald A.: *See*—
Lonsdale, Randall J.; and Hellekson, Ronald A., 4,678,288, Cl. 350-432.000.

Helms, Charles C.; Conlon, Ralph D.; and Delany, Edward B., to Perkin-Elmer Corporation, The. Instantaneous reading multichannel polychromatic spectrophotometer method and apparatus. 4,678,917, Cl. 250-373.000.

Helversen, Frederick D. Canal covering system and method of installing same. 4,678,368, Cl. 405-118.000.

Hempel, Hans D.; Horn, Jurgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ullrich, to Biotest-Serum-Institut GmbH. Blood-culture flask with integrated subculture. 4,678,753, Cl. 435-296.000.

Henault, Jean-Paul; Drapier, Albert; Grochowski, Guy; and Meslif, Alain, to Gaz de France; and Societe Industrielle Auer S.A. Heat exchanger and application to a fluid heating apparatus, particularly a domestic hot water accumulator. 4,677,939, Cl. 122-17.000.

Hendricks, Joe W.: *See*—
Shrull, Dale; and Hendricks, Joe W., 4,677,922, Cl. 111-52.000.

Henkel Kommanditgesellschaft auf aktien: *See*—
Geke, Juergen; and Rutzen, Horst, 4,678,605, Cl. 252-547.000.

Henning, John C., to Product Investment Incorporated. Container for hanger-supported garments. 4,678,079, Cl. 206-279.000.

Hennink, Wilhelmus E.: *See*—
Feijen, Jan; and Hennink, Wilhelmus E., 4,678,671, Cl. 424-443.000.

Hennion, Claude: *See*—
Lewiner, Jacques; and Hennion, Claude, 4,678,897, Cl. 235-436.000.

Hennix i Stockholm AB: *See*—
Grundstedt, Peter; and Taube, Bill, 4,678,018, Cl. 160-135.000.

Henriksson, Bengt-Ake, to Telefonaktiebolaget L M Ericsson. Tractor mechanism for printers. 4,678,109, Cl. 226-74.000.

Henry Dreyfuss Associates: *See*—
Ryan, James M.; Golden, Sanford S.; and Sliker, Larry, 4,678,229, Cl. 297-68.000.

Henry Mann, Inc.: *See*—
Furuya, Harumi, 4,677,732, Cl. 29-563.000.

Hensley, Donald G.: *See*—
Goehner, Robert D.; Glover, Norman I.; and Hensley, Donald G., 4,678,144, Cl. 244-134.00R.

Henze, Christopher P., to Sperry Corporation. Digital power converter input current control circuit. 4,678,984, Cl. 323-285.000.

Herbert Richter, Metallwaren-Apparatebau GmbH & Co.: *See*—
Richter, Herbert, 4,678,081, Cl. 206-387.000.

Herbert, William G., Jr.; Grey, Henry G.; and Reynolds, Bruce C., to Xerox Corporation. Electroforming process and product. 4,678,691, Cl. 428-36.000.

Hercules Incorporated: *See*—
Jabloner, Harold, 4,678,823, Cl. 524-62.000.
Sand, Michael L., 4,678,684, Cl. 427-213.360.

Hergeth, Hubert A. Fiber-bale plucker. 4,678,128, Cl. 241-101.00A.

Hermach, Carl J., to Publishers Equipment Corporation. Conversion of letterpress to offset printing. 4,677,911, Cl. 101-218.000.

Hermens, Joannes L. G., to U.S. Philips Corporation. Integrated radiation detector. 4,678,918, Cl. 250-374.000.

Herwig, Walter: *See*—
Schneller, Arnold; Herwig, Walter; and Erbes, Kurt, 4,678,737, Cl. 430-270.000.

Hess, Heinz; and Peth, Horst, to Robert Bosch GmbH. Circuit for changeable prolongation of the running time of an ultrasound delay line. 4,679,064, Cl. 358-24.000.

Hessell, Edward T.: *See*—
Pastor, Stephen D.; and Hessell, Edward T., 4,678,826, Cl. 524-104.000.

Hesston Corporation: *See*—
Anderson, J. Dale; McMillen, Kenneth R.; and Goertz, Arnold E., 4,677,814, Cl. 56-15.600.

Hetherington, Hoby P.: *See*—
Avison, Malcolm J.; Hetherington, Hoby P.; Jue, Thomas H.; and Rothman, Douglas L., 4,678,995, Cl. 324-309.000.

Hetherington, Todd G. Auxiliary shock absorber assembly. 4,678,204, Cl. 280-710.000.

Heuga Holding b.v.: *See*—
Claessen, Johannes A. H., 4,678,694, Cl. 428-95.000.

Hewlett-Packard Company: *See*—
Finnell, James S., 4,679,167, Cl. 364-900.000.
Jensen, Gordon A.; Reames, Stephen P.; Morris, Jerry D.; and Neal, Scott S., 4,679,193, Cl. 370-94.000.
Neil, Robert B.; and Adleman, George L., 4,679,039, Cl. 340-728.000.

Heymer, Gero: *See*—
Gradl, Reinhard; and Heymer, Gero, 4,678,650, Cl. 423-309.000.

Hi-Tech Systems, Corp.: *See*—
Hametta, Allen W., 4,678,992, Cl. 324-208.000.

Hicks, Cecil B. Electro-mechanical security lock. 4,677,834, Cl. 70-279.000.

Hicks, Loy A., Jr.; Sherwood, Edward P.; and Saks, Thomas J., to Eaton Corporation. Bus duct having improved bus bar clamping structure. 4,678,253, Cl. 439-210.000.

Hicks, Michael S.; and Vannauker, David L., to Mobil Oil Corporation. Method of producing lube stocks from waxy crudes. 4,678,556, Cl. 208-96.000.

Hida, Yoshinori: *See*—
Itoh, Kunio; Kozakai, Shohei; Hida, Yoshinori; Okinoshima, Hiroshige; Okada, Fumio; Oba, Toshio; Shimizu, Hisashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,678,688, Cl. 427-387.000.

Hidaka, Hiroyoshi; and Sone, Takanori, to Asahi Kasei Kogyo Kabushiki Kaisha. Substituted isoquinolinesulfonyl compounds. 4,678,783, Cl. 514-218.000.

Hiestand, Karl: *See*—
Schmid, Herbert; and Hiestand, Karl, 4,677,885, Cl. 82-40.00R.

Higashiyama, Mitsuo, to Sony Corporation. Signal transmission apparatus for a multiple channel system and method for using the same. 4,679,225, Cl. 379-62.000.

Higuchi, Keizo, to Mitsubishi Denki Kabushiki Kaisha. Video display control unit. 4,679,027, Cl. 340-723.000.

Hilbert, Timothy L.: *See*—
Dolan, Michael J.; Hilbert, Timothy L.; and Snyder, John D., 4,678,483, Cl. 55-97.000.

Hill, Warren D.: *See*—
Nagel, Gregory L.; Lee, Anthony; and Hill, Warren D., 4,678,887, Cl. 219-117.100.

Hilti Aktiengesellschaft: *See*—
Bergner, Arndt, 4,678,383, Cl. 411-32.000.

Hinoto, Yuji: *See*—
Itoh, Kunio; Kozakai, Shohei; Hida, Yoshinori; Okinoshima, Hiroshige; Okada, Fumio; Oba, Toshio; Shimizu, Hisashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,678,688, Cl. 427-387.000.

Hioki, Tatsumi: *See*—
Kamigaito, Osami; Doi, Haruo; Noda, Shoji; Hioki, Tatsumi; Itoh, Akio; and Kakeno, Mitsutaka, 4,678,678, Cl. 427-38.000.

Hiramatsu, Kinuo: *See*—
Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, 4,678,054, Cl. 180-225.000.

Hirano, Masao; Takaoka, Motoaki; and Shimura, Mikihiko, to Omron Tateisi Electronics Co. Temperature measuring apparatus. 4,679,157, Cl. 364-557.000.

Hirano, Takahisa; and Hagimoto, Kiyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary type fluid machine. 4,678,415, Cl. 418-50.000.

Hirano, Takahisa; Fukami, Shoji; and Maeda, Mitsutosho, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary type fluid machine. 4,678,416, Cl. 418-55.000.

Hiraoka & Co. Ltd.: *See*—
Obayashi, Tsutomu; Watanabe, Shinobu; and Ino, Kazuhide, 4,678,681, Cl. 427-38.000.

Hirayama, Akira: *See*—
Kawabata, Juheiji; Sugie, Toshinori; Kobata, Fumihiro; and Hirayama, Akira, 4,678,831, Cl. 524-496.000.

Hirose Denki Kabushiki Kaisha: *See*—
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.

Hirose Electric Co., Ltd.: *See*—
Mitani, Ikujirou; Kawanami, Norihide; and Kobayashi, Fumio, 4,678,261, Cl. 439-582.000.

Hirose, Fumiyuki: *See*—
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.

Hirose, Naoya: *See*—
Sugiura, Susumu; Sugino, Takashi; and Hirose, Naoya, 4,679,074, Cl. 358-80.000.

Hirota, Hajime: *See*—
Ogino, Hidekazu; and Hirota, Hajime, 4,678,598, Cl. 252-174.170.

Hiroyoshi, Toshiki, to Bio-Medical Co., Ltd. Cardiovascular prosthesis. 4,678,468, Cl. 623-1.000.

Hirschfeld, Tomas B., to United States of America, Air Force. Precision guided antiaircraft munition. 4,678,142, Cl. 244-3.160.

Hirsius, John L.: *See*—
Green, Carlos J.; Hirsius, John L.; and Book, Marshall K., 4,677,970, Cl. 128-82.100.

Hisano, Katsukuni: *See*—
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.

Hitachi Cable, Ltd.: *See*—
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.

Hitachi, Ltd.: *See*—
Gotou, Shizuo; Kagimasa, Toyohiko; Yoshizumi, Seiichi; and Shintani, Yooichi, 4,679,140, Cl. 364-200.000.
Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, 4,678,571, Cl. 210-202.000.
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
Kanazawa, Hiroshi; Yamashita, Seizi; and Miyashita, Kunio, 4,678,971, Cl. 318-135.000.
Kawakami, Mitsuo; and Kawamoto, Hiroyuki, 4,678,727, Cl. 429-104.000.
Murayama, Seiichi; Tsujii, Kanji; and Yajima, Yusuke, 4,678,536, Cl. 156-635.000.
Ogawa, Toshio; Kondo, Shinichi; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,679,176, Cl. 367-119.000.
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.
Tsujii, Fumio; Matsuoka, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, 4,679,147, Cl. 364-449.000.
Uragami, Akira; Suzuki, Yukio; Kadono, Shinji; Iwamura, Masahiro; Masuda, Ikuro; and Yamauchi, Tatsumi, 4,678,943, Cl. 307-473.000.
Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.

Hitachi Maxell, Ltd.: *See*—
Kitta, Kenichi; Kanazawa, Yasunori; and Otomo, Yoshiro, 4,678,338, Cl. 356-402.000.

Hitachi Medical Corporation: *See*—
Ogawa, Toshio; Kondo, Shinichi; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,679,176, Cl. 367-119.000.

Hitchcock, David C.: *See*—
Lisowyj, Bohdan; Hitchcock, David C.; and Epstein, Henry, 4,678,647, Cl. 423-96.000.

Hjorth-Hansen, Arne. Tire handling apparatus. 4,678,163, Cl. 254-50.200.

Ho, Chih Y., to McNeilab, Inc. Method for the treatment of LHRH diseases and conditions. 4,678,784, Cl. 514-219.000.

Ho, Victor: *See—*
Liu, Marie W.; and Ho, Victor, 4,678,849, Cl. 526-259.000.

Hochbein, David E., to Aluminum Company of America. Anode button facing machine. 4,677,727, Cl. 29-402.060.

Hoechst Aktiengesellschaft: *See—*
Engels, Joachim, 4,678,609, Cl. 260-397.450.
Gradl, Reinhard; and Heymer, Gero, 4,678,650, Cl. 423-309.000.
Heist, Hans; Toepfer, Dieter; and Britzke, Sylvia, 4,678,310, Cl. 354-319.000.
Muller, Heinz; Lohmar, Elmar; and Scholz, Harald, 4,678,482, Cl. 55-71.000.
Peiffer, Herbert; and Eberhardt, Horst, 4,678,339, Cl. 366-76.000.
Pospich, Gunther; and Gutte, Richard, 4,678,832, Cl. 525-60.000.
Schneller, Arnold; Herwig, Walter; and Erbes, Kurt, 4,678,737, Cl. 430-270.000.

Hoffman, David; Verduin, Lee C.; and Ouwinga, Ross, to Rowe International, Inc. Price setting and display system for multiple unit merchandising machine. 4,677,777, Cl. 40-460.000.

Hoffman-La Roche Inc.: *See—*
Dorn, Franz; Pfiffner, Albert; and Zehnder, Beat, 4,678,790, Cl. 514-277.000.

Hoffman, Michael J., to Stauffer-Wacker Silicones Corporation. Aqueous silicone emulsions as bladder lubricants. 4,678,815, Cl. 523-122.000.

Hoffmann, Hellmut: *See—*
Kruger, Bernd-Wieland; Hoffmann, Hellmut; Roos, Ernst; and Behrenz, Wolfgang, 4,678,777, Cl. 514-110.000.

Hoffmann, Jurgen: *See—*
Nodes, Rudolf; and Hoffmann, Jurgen, 4,678,578, Cl. 210-445.000.

Hoffmann-La Roche Inc.: *See—*
Klaus, Michael; and Loeliger, Peter, 4,678,793, Cl. 514-311.000.

Hofmann, Constance J.: *See—*
Marshall, Wayne E.; and Hofmann, Constance J., 4,678,673, Cl. 426-46.000.

Hogeboom, John G.; and Thomas, Terence N., to Northern Telecom Limited. Digital line receiver. 4,679,209, Cl. 375-17.000.

Hokari, Hiroshi: *See—*
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,678,496, Cl. 71-76.000.

Hole, David B.: *See—*
Peterson, Thomas W.; Hole, David B.; and Mintz, S. Stanley, 4,678,952, Cl. 310-83.000.

Holland, Charles J.: *See—*
Epstein, David I.; and Holland, Charles J., 4,679,138, Cl. 364-200.000.

Holland, John M., to Chevron Research Company. Fiber optic receiver having a method and an apparatus for data clock extraction. 4,679,252, Cl. 455-619.000.

Hollandse Signaalapparaten B.V.: *See—*
Bergman, Jan, 4,679,050, Cl. 342-196.000.

Hollaway, Gerald C., Jr., to Dayco Products, Inc. Method of making a fiber-loaded polymeric sheet. 4,678,455, Cl. 474-263.000.

Holler, James M., to Bush Industries, Inc. Adjustable unitary hinge. 4,677,707, Cl. 16-239.000.

Hollis, Richard G., to Mount Isa Mines Limited; and Commonwealth Scientific & Industrial Organization. Treatment of dross. 4,678,507, Cl. 75-24.000.

Holloway, Peter R., to Analog Devices, Incorporated. MOS-cascoded bipolar current sources in non-epitaxial structure. 4,678,936, Cl. 307-303.000.

Holmes, Robert T.; Evans, Terence M.; King, Keith; and Graiff, Leonard B. Diesel fuel composition. 4,678,479, Cl. 44-57.000.

Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Axegård, Peter A., to KemaNord AB. Process for production of chlorine dioxide. 4,678,654, Cl. 423-478.000.

Holt, Richard E. Demountable frames. 4,677,804, Cl. 52-648.000.

Holtman, Dennis C., to Personal Products Company. Absorbent structure with reservoirs and a channel. 4,678,464, Cl. 604-385.00R.

Holzman, James W.: *See—*
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,678,214, Cl. 292-213.000.

Homeyer, Bernard: *See—*
Maurer, Fritz; Homeyer, Bernard; and Stendel, Wilhelm, 4,678,776, Cl. 514-89.000.

Homeyer, Bernhard: *See—*
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ban, Keisuke; and Daimaru, Akimasa, 4,677,901, Cl. 92-213.000.
Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, 4,678,054, Cl. 180-225.000.
Kishi, Toshiaki; and Kohama, Mitsuyoshi, 4,678,223, Cl. 296-78.100.
Suzuki, Norio; Watabe, Akira; and Yamashita, Kazunari, 4,677,959, Cl. 123-587.000.
Watanabe, Masaki; Yamamoto, Hitoshi; Matsuoka, Yoshinori; and Tanaka, Kunihiko, 4,678,053, Cl. 180-210.000.

Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Body frames. 4,678,054, Cl. 180-225.000.

Honda, Kenji, deceased (by Honda, Reiko, executor); and Sawafuji, Tadaaki, to Toho Beslon Co., Ltd.; and Tokyo Rope Manufacturing Co., Ltd. Composite rope and manufacture thereof. 4,677,818, Cl. 57-224.000.

Honda, Reiko, executor: *See—*
Honda, Kenji, deceased; and Sawafuji, Tadaaki, 4,677,818, Cl. 57-224.000.

Honeywell Inc.: *See—*
Berg, Ralph T., 4,678,335, Cl. 356-350.000.
Eder, Kenneth C.; and Krzyanowski, Robert V., 4,679,175, Cl. 367-98.000.
Nelson, Marvin D., 4,679,023, Cl. 337-140.000.

Hoover, Charles D.: *See—*
Bowen, Terry P.; Glover, Douglas W.; Hoover, Charles D.; Huber, John H.; and Schaffer, Ronald R., 4,678,264, Cl. 350-96.200.

Hori, Hiroshi: *See—*
Taniyama, Kiyoshi; and Hori, Hiroshi, 4,677,871, Cl. 74-467.000.

Hori, Keiichi, to Elm Company Ltd. Cassette-type printing head with perforated film member. 4,679,058, Cl. 346-140.00R.

Hori, Masaaki, to Brother Kogyo Kabushiki Kaisha. Apparatus for controlling the carriage of a printer. 4,678,979, Cl. 318-696.000.

Horicke, Hans-Werner: *See—*
Kotitschke, Gerhard; and Horicke, Hans-Werner, 4,677,763, Cl. 34-116.000.

Horii, Yoshiaki: *See—*
Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, 4,678,054, Cl. 180-225.000.

Horike, Masanori: *See—*
Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.

Hormel, Ronald F., to Chrysler Motors Corporation. Multiplexing of a bandpass filter circuit to work with a flux-gate sensor output. 4,677,754, Cl. 33-361.000.

Horn, Jurgen: *See—*
Hempel, Hans D.; Horn, Jurgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ullrich, 4,678,753, Cl. 435-296.000.

Horrocks, Donald L.; and Kampf, Richard S., to Beckman Instruments, Inc. Apparatus for positioning an external radioactive standard in a liquid scintillation counter. 4,678,912, Cl. 250-328.000.

Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, to Hitachi, Ltd. Water purifier. 4,678,571, Cl. 210-202.000.

Hoshowski, Myra A.; and Patel, Chaitanya, to Helene Curtis, Inc. Dye-conditioner composition that is non-staining to skin containing a certified violet dye and a quaternary ammonium compound. 4,678,475, Cl. 8-606.000.

Hosiden Electronics Co., Ltd.: *See—*
Okamoto, Kotaro, 4,679,062, Cl. 357-22.000.

Hoskins, Michael K., to Ciba Corning Corp. Liquid clinical control standard, and reagent products. 4,678,754, Cl. 436-15.000.

Hosoda, Bunichiro: *See—*
Ishii, Hiroshi; and Hosoda, Bunichiro, 4,678,603, Cl. 252-522.00R.

Hosokawa, Motoyuki: *See—*
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Tsuji, Tomoji; and Wakui, Natsuko, 4,678,858, Cl. 568-902.000.

Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, to Fried Krupp Gesellschaft mit beschrankter Haftung. Apparatus for producing ethanol. 4,678,543, Cl. 202-154.000.

House Food Industrial Company Limited: *See—*
Sugisawa, Ko; Matsumura, Yasushi; Sengoku, Koji; and Nagatome, Yoshiaki, 4,678,677, Cl. 426-634.000.

Howard, Charles P.; and Stedman, Donald H., to Sensors, Inc. Liquid separator for gas analyzer. 4,678,488, Cl. 55-406.000.

Howe, Dwayne E.: *See—*
Butcher, William T.; Furlong, James J.; Howe, Dwayne E.; Snell, Gerald T.; and Yara, Calvin M., 4,679,117, Cl. 361-181.000.

Howitt, Henry G.: *See—*
Ransom, Keith C.; and Howitt, Henry G., 4,678,007, Cl. 137-625.660.

Hoyt, John G. Circular linked rotating foil assembly for vessels. 4,677,928, Cl. 114-39.000.

Hsu, Jang-Yu, to GA Technologies Inc. Gyro free electron laser. 4,679,197, Cl. 372-2.000.

Hsu, Shih C.; and Raman, Ramas V., to GTE Laboratories Incorporated. Silver-copper-titanium brazing alloy. 4,678,720, Cl. 428-606.000.

Huber, John H.: *See—*
Bowen, Terry P.; Glover, Douglas W.; Hoover, Charles D.; Huber, John H.; and Schaffer, Ronald R., 4,678,264, Cl. 350-96.200.

Hubner, Henry H., Jr.: *See—*
Viola, Frank J.; and Hubner, Henry H., Jr., 4,678,217, Cl. 294-16.000.

Huddy Diamond Crown Setting Company (Proprietary) Limited: *See—*
Collin, William D., 4,678,237, Cl. 299-79.000.

Huggins, Richard A. Cleaning system for static charged semiconductor wafer surface. 4,677,704, Cl. 15-1.50R.

Hughes Aircraft Company: *See—*
Crookshanks, Rex J., 4,679,161, Cl. 364-571.000.
Shifrin, Gordon A.; and Hunsperger, Robert G., 4,677,740, Cl. 29-576.00B.
Tsuda, George I., 4,679,207, Cl. 375-1.000.

Hughes-Hartogs, Dirk, to Telebit Corporation. Ensemble modem structure for imperfect transmission media. 4,679,227, Cl. 379-98.000.

Hughes Tool Company: *See—*
Lorett, Jerzy A.; and Vandevier, Joseph E., 4,678,404, Cl. 417-45.000.
Vandevier, Joseph E.; Bearden, John L.; Pranger, William F.; and Miller, Harold L., 4,678,399, Cl. 415-199.200.

Huiban, Jean-Yves: *See—*
Connan, Jean-Louis; and Huiban, Jean-Yves, 4,679,115, Cl. 361-119.000.
Huijsing, Johan H.; and Dhuyvetter, Timothy A., to Signetics Corporation. Simulated transistor/diode. 4,678,947, Cl. 307-490.000.
Huisman, Hendrikus F.; and Pigmans, Henricus J. M., to Du Pont de Nemours, E. I., and Company. Composition and method for making magnetic recording elements. 4,678,705, Cl. 428-315.900.
Hull, John R.; Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., to United States of America, Energy. Horizontal electromagnetic casting of thin metal sheets. 4,678,024, Cl. 164-503.000.
Hunsperger, Robert G.: *See—*
Shifrin, Gordon A.; and Hunsperger, Robert G., 4,677,740, Cl. 29-576.00B.
Hunter Engineering (Canada) Ltd.: *See—*
Ellison, Kenneth, 4,678,433, Cl. 432-59.000.
Hurley, Clive: *See—*
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.
Hurter, Rudolf, to Ciba-Geigy Corporation. Novel dyestuff intermediates and use thereof for the manufacture of novel azo dyes. 4,678,611, Cl. 260-510.000.
Huse, Syozi: *See—*
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.
Husky Injection Molding System Ltd.: *See—*
Fritzsche, Klaus, 4,678,427, Cl. 425-562.000.
Husqvarna Aktiebolag: *See—*
Bergvall, Bengt A., 4,677,927, Cl. 112-455.000.
Hutchinson, Albert L.: *See—*
Capasso, Federico; Cho, Alfred Y.; Hutchinson, Albert L.; and Mohammed, Khalid, 4,679,061, Cl. 357-4.000.
Huttenes-Albertus Chemische Werke GmbH: *See—*
Torbus, Marek, 4,678,816, Cl. 523-142.000.
Hutzel, Hans: *See—*
Beck, Ernst; Lenard, Peter; and Hutzel, Hans, 4,677,882, Cl. 76-77.000.
Hwang, Shih-Ming. Device to facilitate the arming of an alarm system and to provide lock-out protection. 4,679,031, Cl. 340-501.000.
Hwang, Shih-Ming. Structure of vibration sensor. 4,679,033, Cl. 340-566.000.
Hydra-Tech, Inc.: *See—*
Capers, Jerry W.; Capers, Donald L.; and Capers, Douglas W., 4,678,392, Cl. 414-563.000.
Hynecek, Jaroslav, to Texas Instruments Incorporated. Method and apparatus for using surface trap recombination in solid state imaging devices. 4,679,212, Cl. 377-58.000.
Hyodo, Tohru: *See—*
Murakami, Eiji; Sano, Yasuro; and Hyodo, Tohru, 4,677,925, Cl. 112-266.100.
Iacoviello, John G., to Air Products and Chemicals, Inc. Metal container coating compositions comprising stable emulsions of water resistant polyvinyl alcohol-stabilized vinyl chloride-ethylene copolymers. 4,678,829, Cl. 524-459.000.
Iadipaolo, Rene M.; and Tkaczyk, Richard J., to General Motors Corporation. Machine vison method and apparatus. 4,678,920, Cl. 250-560.000.
Ichihana, Hideyuki: *See—*
Takamatsu, Masayoshi; Hashimoto, Kouji; Manabe, Akiyoshi; and Ichihana, Hideyuki, 4,678,845, Cl. 525-462.000.
Ichijima, Seiji: *See—*
Yamada, Kohzaburoh; Ichijima, Seiji; and Usui, Hideo, 4,678,743, Cl. 430-551.000.
Ichimura, Kunihiro: *See—*
Sakuragi, Masako; and Ichimura, Kunihiro, 4,678,844, Cl. 525-417.000.
ICI Pharma: *See—*
Jung, Frederic, 4,678,781, Cl. 514-200.000.
Idemitsu Kosan Company Limited: *See—*
Sonoda, Noboru, 4,677,844, Cl. 73-55.000.
Ihara, Keiichi, to TDK Corporation. Apparatus for automatically mounting special-type chips on substrate. 4,677,745, Cl. 29-741.000.
Iida, Tetsuya; and Ikarashi, Takayoshi, to Kabushiki Kaisha Toshiba. Synchronous binary counter. 4,679,216, Cl. 377-116.000.
Iida, Yasuhiro: *See—*
Imakoshi, Shigeyoshi; Soda, Yutaka; Suyama, Hideo; and Iida, Yasuhiro, 4,679,107, Cl. 360-113.000.
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, to Hitachi, Ltd. Gas turbine combustor. 4,677,822, Cl. 60-39.230.
Ikarashi, Takayoshi: *See—*
Iida, Tetsuya; and Ikarashi, Takayoshi, 4,679,216, Cl. 377-116.000.
Ikariya, Takao; Itagaki, Masanori; Mizuguchi, Masatsugu; Sakai, Itaru; and Tajima, Osamu, to Nippon Kokan Kabushiki Kaisha. Method of manufacturing aromatic urethane and intermediate product thereof. 4,678,856, Cl. 560-24.000.
Ikeda, Mitsuhiro: *See—*
Tamamori, Hideo; and Ikeda, Mitsuhiro, 4,678,241, Cl. 303-33.000.
Ikedo, Masaru; Watari, Masafumi; Hayashi, Yoshiaki; Yamamoto, Osamu; and Tsutsu, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Optical fiber for infrared transmission consisting essentially of high purity mixed crystal of thallium bromide and thallium iodide. 4,678,275, Cl. 350-96.340.
Ikezue, Tatsuya: *See—*
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, 4,678,731, Cl. 430-65.000.
Illinois Tool Works Inc.: *See—*
Ollivier, Jean; and Almeras, Roland, 4,678,385, Cl. 411-456.000.
Imai, Chihiro: *See—*
Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihiro; and Makishima, Tokuo, 4,678,767, Cl. 502-104.000.
Imai, Kiyoshi: *See—*
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Smith, Anthony P., 4,677,821, Cl. 60-39.020.
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Link, Helmut F., 4,677,719, Cl. 29-40.000.
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Dagna, Giandomenico, 4,679,059, Cl. 346-140.00R.
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Bourassa, Ronald R.; and Butler, Douglas B., 4,679,170, Cl. 365-154.000.
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Willard, Stephen J., 4,678,251, Cl. 439-61.000.
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Danree, Bernard, 4,678,810, Cl. 514-640.000.
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Belluteau, Jean-Pierre; Bocard, Christian; Such, Christian; and Vaillant, Daniel, 4,678,558, Cl. 208-390.000.

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Peterson, Thomas W.; Hole, David B.; and Mintz, S. Stanley, 4,678,952, Cl. 310-83.000.
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Arldt, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., 4,678,175, Cl. 271-34.000.
Bantz, David F.; Malaby, Davey L.; and Sholtz, Paul N., 4,679,038, Cl. 340-721.000.
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Dias, Daniel M.; Kumar, Manoj; Lien, Yeong-Chang L.; and Maruyama, Kiyoshi, 4,679,190, Cl. 370-60.000.
Hatzakis, Michael; Liutkus, John J.; Paraszczak, Jurij R.; and Shaw, Jane M., 4,678,850, Cl. 526-293.000.
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West, Lynn P., 4,679,001, Cl. 328-167.000.
Workman, Michael L., 4,679,103, Cl. 360-77.000.
International Fuel Cells Corporation: *See*—
Wertheim, Ronald J., 4,678,723, Cl. 429-17.000.
International Standard Elecric Corporation: *See*—
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Intertec Associates Inc.: *See*—
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., 4,678,028, Cl. 165-72.000.
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Inui, Jun: *See*—
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Mandle, Robert J.; and McRae, Wayne A., 4,678,553, Cl. 204-182.600.
Iowa State University Research Foundation, Inc.: *See*—
Ruble, Marshall V., 4,678,893, Cl. 235-70.00R.
IRECO Incorporated: *See*—
Cranney, Don H.; Gordon, David L.; and Hales, Richard H., 4,678,524, Cl. 149-21.000.
Irvin, David R., to International Business Machines Corp. Adaptive trunk-compression system with constant grade of service. 4,679,187, Cl. 370-17.000.
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Kobayashi, Takeshi; Ishii, Ryouichi; and Kitamoto, Tomoyoshi, 4,679,135, Cl. 364-146.000.
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Ishizuka, Masashi; and Ogawara, Makoto, to Kawasaki Jukogyo Kabushiki Kaisha. Construction of vehicle body. 4,678,226, Cl. 296-203.000.
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Isotechnologies, Inc.: *See*—
McIntyre, Donald R.; and Miles, James E., 4,678,186, Cl. 272-134.000.
Isuzu Motors Limited: *See*—
Hattori, Toshihiro; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,677,880, Cl. 74-866.000.
Yoshimura, Hiroshi; and Hattori, Toshihiro, 4,678,069, Cl. 192-0.033.
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Ito, Koichi: *See*—
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Ito, Masaya: *See*—
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Ito, Seigo: *See*—
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Ito, Toshimitsu; and Okamoto, Akio, to Toyota Jidosha Kabushiki Kaisha. Method and system incorporating zero-correction for fuel supply control for internal combustion engine. 4,677,954, Cl. 123-478.000.
Itoh, Akio: *See*—
Kamigaito, Osami; Doi, Haruo; Noda, Shoji; Hioki, Tatsumi; Itoh, Akio; and Kakeno, Mitsutaka, 4,678,678, Cl. 427-38.000.
Itoh, Akira: *See*—
Nakao, Shinroku; Itoh, Masao; Itoh, Akira; and Takano, Hiroshi, 4,678,182, Cl. 272-73.000.
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Itoh, Kunio; Imai, Kiyoshi; Yoshida, Takeo; and Fukushima, Motoo, to Shin-Etsu Chemical Co., Ltd. Flame-retardant silicone rubber composition. 4,678,827, Cl. 524-188.000.
Itoh, Masao: *See*—
Nakao, Shinroku; Itoh, Masao; Itoh, Akira; and Takano, Hiroshi, 4,678,182, Cl. 272-73.000.
ITT Gallium Arsenide Technology Center, a division of ITT Corporation: *See*—
Bahl, Inder J., 4,679,010, Cl. 333-109.000.
ITT Gilfillan, a division of ITT Corporation: *See*—
Rathi, Devdas D., 4,679,210, Cl. 375-96.000.
Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., to T P O "Pharmachim". 1-(3,4-dimethylbenzyl)-2-(N-alkyl)-carbamoyl tetrahydroiso quinolines. 4,678,853, Cl. 546-146.000.
Iwai, Tomio; and Matsushita, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor with turbo-charger. 4,677,826, Cl. 60-602.000.
Iwami, Tomonori: *See*—
Nogi, Tatsuo; Iwami, Tomonori; and Tanaka, Kazumi, 4,678,581, Cl. 210-500.230.
Iwamoto, Yoshinao: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,678,371, Cl. 405-164.000.
Iwamura, Masahiro: *See*—
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Iwano, Hideo; and Shudo, Kazuo, to Mitutoyo Mfg. Co., Ltd. Coordinate measuring instrument. 4,677,755, Cl. 33-503.000.
Iwasaki, Hirofumi: *See*—
Shibasaki, Akio; and Iwasaki, Hirofumi, 4,678,703, Cl. 428-288.000.
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Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Method of making a photovoltaic panel. 4,677,738, Cl. 29-572.000.
Izukawa, Kazuhiro; Tsukimoto, Takayuki; and Okumura, Ichiro, to Canon Kabushiki Kaisha. Vibration wave motor. 4,678,956, Cl. 310-323.000.
Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, to Ricoh Company, Ltd. Device for detecting viscosity of liquid. 4,677,845, Cl. 73-56.000.
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Kemp, Philip, 4,678,693, Cl. 428-91.000.
J. M. Voith GmbH: *See*—
Kotitschke, Gerhard; and Horicke, Hans-Werner, 4,677,763, Cl. 34-116.000.
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Weitemeyer, Christian; and Jachmann, Jurgen, 4,678,846, Cl. 525-477.000.

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Jackson, Warren M., to Warren M. Jackson, Inc. Flat die thread roller. 4,677,837, Cl. 72-88.000.

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Jacobs, Paul F.: *See*—
Finkel, Joel R.; Jacobs, Paul F.; Gustafson, Kenneth I.; and Green, William D., 4,678,322, Cl. 355-133.000.

Jacques, Paseri, to Recherches et Etudes d'Optique et de Sciences Connexes. Reduced-weight mirror. 4,678,293, Cl. 350-609.000.

Jaen, Juan C.; and Wise, Lawrence D., to Warner-Lambert Company. 4H-1-benzopyran-4-ones and their sulfur containing analogs. 4,678,787, Cl. 514-253.000.

Jagel, Kenneth I.: *See*—
Wan, Chung-Zong; Dettling, Joseph C.; and Jagel, Kenneth I., 4,678,770, Cl. 502-304.000.

Jahnke, Bernd, to Aktiengesellschaft Brown, Boveri & Cie. Metallic joining material. 4,678,635, Cl. 420-449.000.

Jakobsmeyer, Helmut: *See*—
Ernst, Hans-Otto; and Jakobsmeyer, Helmut, 4,679,127, Cl. 362-294.000.

James River-Norwalk: *See*—
Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., 4,678,882, Cl. 219-10.55E.

Jandeska, William F., Jr.; and Rezhets, Vadim, to General Motors Corporation. Wear resistant iron powder article. 4,678,510, Cl. 75-244.000.

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Murakami, Eiji; Sano, Yasuro; and Hyodo, Tohru, 4,677,925, Cl. 112-266.100.

Janssen, Robert A., to CIBA-GEIGY Corporation. Particulate hydroperoxidized poly-N-vinyl lactam, its preparation and use thereof. 4,678,838, Cl. 525-326.900.

Janvier, Dominique: *See*—
Bonneton, Marc; and Janvier, Dominique, 4,678,390, Cl. 414-282.000.

Japan Aviation Electronics Industry Limited: *See*—
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.

Japan Tobacco Inc.: *See*—
Kato, Yukio; Komori, Mikio; and Yonai, Tadao, 4,677,993, Cl. 131-280.000.

Japan Tobacco & Salt Public Corporation, The: *See*—
Kobayashi, Takeshi; Ishii, Ryouichi; and Kitamoto, Tomoyoshi, 4,679,135, Cl. 364-146.000.

Jelodin, Stephane: *See*—
Schapira, Joseph; Ken, Victor; Thery, Denis; and Jelodin, Stephane, 4,678,519, Cl. 148-6.15Z.

Jeng, Tzong K., to General Electric Company. One-shot tuning circuit. 4,679,246, Cl. 455-183.000.

Jenmar Corporation: *See*—
Calandra, Frank, Jr., 4,678,374, Cl. 405-261.000.

Jensen, Deborah P.: *See*—
Jensen, Tom M.; Yoshimura, Frederick T.; and Jensen, Deborah P., 4,678,202, Cl. 280-642.000.

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Denier, Robert F.; Marshall, Robert H.; Jewell, John N.; and Litzinger, Elmer F., 4,677,994, Cl. 131-310.000.

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Suzuki, Yoshio; and Yamaguchi, Seiji, 4,678,052, Cl. 180-143.000.

Jilek, Jiri: *See*—
Protiva, Miroslav; Jilek, Jiri; Cervena, Irena; Dlabac, Antonin; Valchar, Martin; and Pomykacek, Josef, 4,678,788, Cl. 514-254.000.

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Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.

Jirka, Howard F., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Floating battery feed circuit using multifilar transformer. 4,679,132, Cl. 363-21.000.

Joby, Michael J.: *See*—
Morris, Clive A.; and Joby, Michael J., 4,679,151. Cl. 364-510.000.

Jochim, Michael M.; and Jones, Suzanne C., to United States of America, Agriculture. Monoclonal antibodies to epizootic hemorrhagic disease virus antigen. 4,678,746, Cl. 435-5.000.

John Wyeth & Brother Limited: *See*—
Crossley, Roger, 4,678,794, Cl. 514-332.000.

Johns Hopkins University, The: *See*—
Irzinski, Edward P.; Krill, Jerry A.; and Zinger, William H., 4,679,008, Cl. 333-21.00R.

Johns, Robert H.; and Nauman, John D., to Allegheny Ludlum Corporation. Method and apparatus for continuous casting of crystalline strip. 4,678,719, Cl. 428-593.000.

Johnson, Bruce C.: *See*—
Hallgren, John E.; Policastro, Peter P.; Chao, Herbert S.; and Johnson, Bruce C., 4,678,839, Cl. 525-390.000.

Johnson, David W. Question and answer game structure particularly for use in a restaurant or the like. 4,678,188, Cl. 273-1.00R.

Johnson, Donald L.: *See*—
Malik, Arshad H.; Urfer, Allen D.; McDaniel, Robert S.; and Johnson, Donald L., 4,678,595, Cl. 252-174.170.

Johnson, Glenn S.: *See*—
Metzger, David B.; Johnson, Glenn S.; and Bramel, Michael D., 4,678,531, Cl. 156-250.000.

Johnson, Henry S.: *See*—
Roberts, David; and Johnson, Henry S., 4,678,493, Cl. 65-134.000.

Johnson, Philip A.; and McCarthy, Alfred F., to Aavid Engineering, Inc. Electronic chip-carrier heat sinks. 4,679,118, Cl. 361-386.000.

Johnson, Raymond A. Motor mount assembly. 4,678,953, Cl. 310-91.000.

Johnson, Robert A. Food steaming apparatus. 4,677,905, Cl. 99-413.000.

Johnson, Robert C.: *See*—
Cotter, Richard; Johnson, Robert C.; Rowe, W. Bruce; and Young, Susan K., 4,678,807, Cl. 514-552.000.

Johnson, Robert R., to Energy Conversion Devices, Inc. Electronic matrix arrays and method for making the same. 4,677,742, Cl. 29-591.000.

Johnson, Robert R.; and Chapelle, Walter E., to Energy Conversion Devices, Inc. Digital integrated electronic storage system for video and audio playback. 4,679,085, Cl. 358-160.000.

Johnston, Howard; and Troxell, Lillian H., to Dow Chemical Company, The. Certain pyridyloxy or thrio-phenoxy-propanoic acids or salts thereof useful as herbicides. 4,678,509, Cl. 71-94.000.

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Noiles, Douglas G., 4,678,472, Cl. 623-1.800.

Jones, Julian D. C.: *See*—
Jackson, David A.; Corke, Michael; Kersey, Alan D.; and Jones, Julian D. C., 4,678,909, Cl. 250-231.00P.

Jones, Ralph W. Control of line wrapping on reel, by reel groove design. 4,678,135, Cl. 242-117.000.

Jones, Ronald R., to National Communications Research Center, Inc. Apparatus and method for processing stereo signals for application to an AM stereo broadcasting unit. 4,679,239, Cl. 381-16.000.

Jones, Suzanne C.: *See*—
Jochim, Michael M.; and Jones, Suzanne C., 4,678,746, Cl. 435-5.000.

Joppien, Hartmut: *See*—
Franke, Helga; Franke, Heinrich; Kruger, Hans-Rudolf; and Joppien, Hartmut, 4,678,811, Cl. 514-721.000.

Jordan, Gary V.: *See*—
Curtis, Stephen P.; and Jordan, Gary V., 4,679,046, Cl. 342-51.000.

Jordan, Mark T.; and Ferragamo, Mark. Ladder roof brace. 4,678,061, Cl. 182-206.000.

Jorde, James E. Chain saw sharpener. 4,677,881, Cl. 76-25.00A.

Josenhans, Frederick G. Carrying handle for two bottles having built in carrying lips. 4,678,221, Cl. 294-170.000.

Jue, Thomas H.: *See*—
Avison, Malcolm J.; Hetherington, Hoby P.; Jue, Thomas H.; and Rothman, Douglas L., 4,678,995, Cl. 324-309.000.

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Tominaga, Kazutoshi, 4,677,938, Cl. 119-29.000.

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den Broeder, Friedrich J. A.; Draaisma, Henricus J. G.; and Kahle, Alexander, 4,678,721, Cl. 428-607.000.

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Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.

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Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.

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Schoettle, Klaus; Schmidts, Kurt; Kamm, Eugen; and Berger, Heinz, 4,679,110, Cl. 360-132.000.

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Kampf, Richard S.: *See*—
Horrocks, Donald L.; and Kampf, Richard S., 4,678,912, Cl. 250-328.000.

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Kaneiwa, Shinji: *See*—
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Kaneko, Atsumi: *See*—
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Kaneko, Takaoki: *See*—
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Kao Corporation: *See*—
Ogino, Hidekazu; and Hirota, Hajime, 4,678,598, Cl. 252-174.170.

Karbach, Stefan: *See*—
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Karhu Titan Canada Limitee: *See*—
Angas, David J., 4,677,698, Cl. 2-161.00A.

Karlsson, Karl-Anders: *See*—
Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettgen, Herbert F., 4,678,747, Cl. 435-7.000.

Karmon, Mordechai: *See*—
Hasson, David; and Karmon, Mordechai, 4,678,685, Cl. 427-235.000.

Karp, Joel A.: *See*—
Logwood, Dennis J.; Haq, Mohammed E. U.; Reed, John A.; and Karp, Joel A., 4,679,171, Cl. 365-154.000.

Kasai, Hitoshi: *See*—
Hattori, Toshihiro; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,677,880, Cl. 74-866.000.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Front cover for baby carriages. 4,678,222, Cl. 296-78.00A.

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Kataoka, Koichi; and Kabumoto, Takashi, to Kabushiki Saisha Ishida Koki Seisakusho. Article supply for a combinatorial weighing machine. 4,678,047, Cl. 177-1.000.

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Kato, Kouichi: *See*—
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Kato, Masatoshi: *See*—
Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masasi; and Tsukase, Masaaki, 4,678,735, Cl. 430-203.000.
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Sugimoto, Shigeyuki; Kato, Masayuki; and Chonan, Katsuhiko, 4,678,980, Cl. 318-759.000.

Kato, Minoru: *See*—
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, 4,678,921, Cl. 250-574.000.

Kato, Shigenobu: *See*—
Bando, Yoshiaki; Asano, Teruyoshi; Kato, Shigenobu; and Tanioka, Katsuhiko, 4,678,161, Cl. 251-171.000.

Kato, Toshiaki, to Fuji Electric Co., Ltd. Solid state image sensor having an anti-blooming isolation electrode. 4,679,089, Cl. 358-213.190.

Kato, Yukio; Komori, Mikio; and Yonai, Tadao, to Japan Tobacco Inc. Method of and apparatus for inspecting cigarette paper. 4,677,993, Cl. 131-280.000.

Katsurai, Junji; Monma, Masao; and Takaku, Tetsuo, to Konishiroku Photo Industry Co., Ltd. Thermal variable velocity printer system. 4,679,053, Cl. 346-1.100.

Katsuyama, Shigeru: *See*—
Kondo, Kenji; Katsuyama, Shigeru; Akahane, Shoji; and Tomioka, Kentaro, 4,678,436, Cl. 433-228.100.

Katz, Maurice D. Anti-burglary device for automobile radios and cassettes. 4,678,874, Cl. 200-43.120.

Kawabata, Juheiji; Sugie, Toshinori; Kobata, Fumihiro; and Hirayama, Akira, to Dainippon Ink and Chemicals, Inc. Block copolymers and resin compositions. 4,678,831, Cl. 524-496.000.

Kawabata, Takashi: *See*—
Sato, Yuichi; Tsunekawa, Tokuichi; and Kawabata, Takashi, 4,678,323, Cl. 365-4.000.

Kawabuchi, Masami, to Matsushita Electric Industrial Co., Ltd. Ultrasonic probe. 4,677,853, Cl. 73-644.000.

Kawado, Yasuhumi: *See*—
Osaki, Sigemi; Yousina, Norio; Morishita, Tsuyoshi; and Kawado, Yasuhumi, 4,678,633, Cl. 419-8.000.

Kawaguchi, Seiji. Automatic soldering device. 4,678,886, Cl. 219-85.00R.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,677,889, Cl. 84-1.010.

Kawakami, Mitsuo; and Kawamoto, Hiroyuki, to Hitachi, Ltd. Sodium-sulfur cell block. 4,678,727, Cl. 429-104.000.

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Kawakami, Mitsuo; and Kawamoto, Hiroyuki, 4,678,727, Cl. 429-104.000.

Kawamura, Kiyoshi: *See*—
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Kawamura, Toshimi; and Satow, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Superconducting solenoid and method of making same. 4,679,020, Cl. 335-216.000.

Kawanami, Norihide: *See*—
Mitani, Ikujirou; Kawanami, Norihide; and Kobayashi, Fumio, 4,678,261, Cl. 439-582.000.

Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, to Nippon Steel Corporation. Cold rolled steel sheet having excellent press formability and method for producing the same. 4,678,522, Cl. 148-12.00C.

Kawasaki, Atsushi: *See*—
Boer, Willem D.; and Kawasaki, Atsushi, 4,678,542, Cl. 156-659.100.

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Ishizuka, Masashi; and Ogawara, Makoto, 4,678,226, Cl. 296-203.000.
Murase, Masaaki, 4,678,441, Cl. 440-88.000.
Nishida, Hiroshi; and Inoue, Takemi, 4,677,872, Cl. 74-551.900.
Nishida, Hiroshi; and Yazaki, Mitsuhiro, 4,678,442, Cl. 440-89.000.

Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, to Nippon Telegraph & Telephone Public Corporation; NEC Corporation; and Kabushiki Kaisha Toshiba. Method of transmitting terminating call signals within a restricted duration and a base station and a portable unit for use in the same. 4,679,244, Cl. 455-54.000.

Kawasaki Steel Corporation: *See*—
Shinozaki, Masatoshi; Matsumoto, Yoshihiro; Aoyagi, Yoshiki; and Kojima, Kazuhisa, 4,678,707, Cl. 428-323.000.

Kawashima, Giichi, to Sumitomo Bakelite Company Limited. Method of producing permanent magnet. 4,678,616, Cl. 264-24.000.

Kawate, Keith W.: *See*—
Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W., 4,678,982, Cl. 322-8.000.

Kawazoe, Toshiji: *See*—
Nozawa, Shigenori; Ohaya, Katsumi; and Kawazoe, Toshiji, 4,678,666, Cl. 424-81.000.

Kaye, Gordon E.; and Agnello, Joseph A., Jr., to Univention Inc., a part interest. Position actuated illuminated gunsight. 4,677,782, Cl. 42-100.000.

Kazumi, Jiro, to Canon Kabushiki Kaisha. Interval shooting device. 4,678,304, Cl. 354-173.110.

Kearney, Thomas J. Treatment of wash water in paint spray booths. 4,678,586, Cl. 210-743.000.

Keen, Egbert. Device comprising a frame of lengths of tube and coupling pieces and coupling piece for the same. 4,678,359, Cl. 403-170.000.

Keenan, Andrea C.: *See*—
Dupre, Jean; and Keenan, Andrea C., 4,678,596, Cl. 252-174.240.

Keenan, Ronald M.: *See*—
Korsky, Vincent V.; and Keenan, Ronald M., 4,679,228, Cl. 379-165.000.

Kelland, David R., to Massachusetts Institute of Technology. Method for desulfurization of coal. 4,678,478, Cl. 44-1.0SR.

Kellogg, Joseph A.; and Prather, James E., to Non Mar, Inc. Automotive body tool. 4,677,840, Cl. 72-465.000.

Kelman, Charles D. Intraocular lens with glare-inhibiting closure, the method of inhibiting glare, and the closure for same. 4,678,469, Cl. 623-6.000.

KemaNord AB: *See*—
Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Axegård, Peter A., 4,678,654, Cl. 423-478.000.
Norell, Maria G.; and Wanngård, Johan C., 4,678,653, Cl. 423-478.000.

Kemeny, George A.: *See*—
Carlson, Richard J.; and Kemeny, George A., 4,677,895, Cl. 89-8.000.

Kemp, Philip, to J. E. Morgan Knitting Mills, Inc. Insulating fabric and method of manufacture thereof. 4,678,693, Cl. 428-91.000.

Ken, Victor: *See*—
Schapira, Joseph; Ken, Victor; Thery, Denis; and Jelodin, Stephane, 4,678,519, Cl. 148-6.15Z.

Kennecott Corporation: *See*—
Thomas, Dwight J.; and Ashelin, Charles J., 4,678,577, Cl. 210-441.000.

Kennedy, Lyn R., to Precision Measurement, Inc. Method and apparatus for measuring the relative density of gases. 4,677,841, Cl. 73-30.000.

Kenner Parker Toys Inc.: *See*—
Ventura, Frank D., 4,678,451, Cl. 446-471.000.

Kent Scientific and Industrial Projects Limited: *See*—
Jackson, David A.; Corke, Michael; Kersey, Alan D.; and Jones, Julian D. C., 4,678,909, Cl. 250-231.00P.

Kenway, Sidney, to Eaton Corporation. Panel mounted apparatus with front operated clamping means. 4,678,879, Cl. 200-295.000.

Keptel, Inc.: *See*—
Lynch, Daniel; and Perry, Steven B., 4,679,224, Cl. 379-26.000.

Kern, Mark T.; and Cinzori, Robert J., to Santa Barbara Research Center. Microprocessor-controlled fire sensor. 4,679,156, Cl. 364-551.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Radkowsky, Alvin, 4,678,619, Cl. 376-173.000.

Kersey, Alan D.: *See*—
Jackson, David A.; Corke, Michael; Kersey, Alan D.; and Jones, Julian D. C., 4,678,909, Cl. 250-231.00P.

Keskkula, Henno: *See*—
McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,678,833, Cl. 525-66.000.

Keys, Robert O., to Sherex Chemical Company, Inc. Promoters for froth flotation of coal. 4,678,561, Cl. 209-166.000.

Keys, Robert O., to Sherex Chemical Company, Inc. Promotors for froth floatation of coal. 4,678,562, Cl. 209-166.000.

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Kida, Otojiro; and Segawa, Yutaka, to Asahi Glass Company Ltd. ZrB_2 composite sintered material. 4,678,759, Cl. 501-92.000.

Kidde, Inc. (Presto Lock Company Division): *See*—
Remington, Richard C., 4,677,832, Cl. 70-67.000.

Kiener, Michael A., to AM International, Inc. Chemical cleaning solution and method. 4,678,597, Cl. 252-100.000.

Kikendall, Garth D.: *See*—
Sparling, Kenneth P.; Richardson, David G.; Incardona, Angelo; Wood, Ronald E.; Kikendall, Garth D.; and Bakow, Leon, 4,678,384, Cl. 411-43.000.

Kikuchi, Masafumi; Onodera, Toshio; Toyama, Sumio; and Sakamoto, Hiroshi, to Sony Corporation. Multiple scanning type television receiver. 4,679,091, Cl. 358-242.000.

Kikuchi, Yoichi; and Kobayashi, Kenji, to Matsushita Electric Industrial Co., Inc. Hermetically sealed storage battery. 4,678,725, Cl. 429-53.000.

Kikutani, Fumitaka: *See*—
Tanaka, Eiichi; Furumai, Koro; and Kikutani, Fumitaka, 4,678,428, Cl. 431-76.000.

Killop, James T.: *See*—
Anderson, Carl E.; and Killop, James T., 4,677,836, Cl. 72-88.000.

Killough, John E., to Atlantic Richfield Company. Hydrocarbon recovery process. 4,678,033, Cl. 166-246.000.

Kimberly-Clark Corporation: *See*—
Van Gompel, Paul T.; and Suprise, Jody D., 4,677,695, Cl. 2-79.000.

Kincheloe, David W. Tape transport apparatus. 4,678,137, Cl. 242-192.000.

Kind, Wilhelm: *See*—
Hafner, Udo; Hans, Waldemar; Kind, Wilhelm; Krauss, Rudolf; and Sauer, Rudolf, 4,678,124, Cl. 239-585.000.

King, Bonnie J., to Shell Oil Company. Apparatus for catalyst preparation by reactive sublimation. 4,678,769, Cl. 502-231.000.

King, Keith: *See*—
Holmes, Robert T.; Evans, Terence M.; King, Keith; and Graiff, Leonard B., 4,678,479, Cl. 44-57.000.

King, Raymond A.; Larson, Jeffrey G.; and Walton, Lewis A., to Babcock & Wilcox Company, The. Spacer grid insert. 4,678,630, Cl. 376-438.000.

King Taudevin & Gregson (Holdings) Limited: *See*—
Roberts, David; and Johnson, Henry S., 4,678,493, Cl. 65-134.000.

King, William F., to Chevron Research Company. Fungicidal benzylthiostannanes. 4,678,804, Cl. 514-493.000.

Kirlick, John: *See*—
Rutherford, David G.; Regnault, Alain; and Kirlick, John, 4,679,094, Cl. 358-261.000.

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Maeno, Kunio; and Kisanuki, Hisayuki, 4,678,696, Cl. 428-122.000.

Kiser, Billy J.: *See*—
Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., 4,678,173, Cl. 270-45.000.

Kishi, Toshiaki; and Kohama, Mitsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Cowling device for riding type vehicles. 4,678,223, Cl. 296-78.100.

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Kitahara, Seizaburo: *See*—
Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegasi, Takasi; and Yamaoka, Isao, 4,677,934, Cl. 118-58.000.

Kitamoto, Tatsuji: *See*—
Asai, Takamitsu; Akashi, Goro; Kitamoto, Tatsuji; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,678,682, Cl. 427-48.000.

Kitamoto, Tomoyoshi: *See*—
Kobayashi, Takeshi; Ishii, Ryouichi; and Kitamoto, Tomoyoshi, 4,679,135, Cl. 364-146.000.

Kitamura, Hideaki; and Yamada, Mitsuhiko, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus of scanning and recording image. 4,679,095, Cl. 358-280.000.

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Kitta, Kenichi; Kanazawa, Yasunori; and Otomo, Yoshiro, to Hitachi Maxell, Ltd. Color sensor. 4,678,338, Cl. 356-402.000.

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Kittleson, Karl A., to Northern Engineering, Inc. Potentiometer contact wiper. 4,679,024, Cl. 338-160.000.

Kiuchi, Masayoshi, to Canon Kabushiki Kaisha. Film feeding indication device for camera. 4,678,306, Cl. 354-217.000.

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Fujita, Masahito; Miyazaki, Makoto; Kizaki, Masami; Nagashima, Yukio; and Shimbori, Yuichi, 4,678,768, Cl. 502-119.000.

Kizawa, Horofumi, to Kabushiki Kaisha Komatsu Seisakusho. Fuel injection system for internal-combustion engines. 4,677,953, Cl. 123-450.000.

Klaeger, Karlheinz. Spray nozzle for a liquid atomizer. 4,678,123, Cl. 239-464.000.

Klaus, Michael; and Loeliger, Peter, to Hoffmann-La Roche Inc. Heterocyclic compounds. 4,678,793, Cl. 514-311.000.

Kleinrahm, Rainer: *See*—
Losch, Hans-Wilhelm; Kleinrahm, Rainer; Pieperbeck, Norbert; and Wagner, Wolfgang, 4,678,048, Cl. 177-212.000.

Klingel, Hans. Folded CO_2 laser. 4,679,201, Cl. 372-61.000.

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Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.

Klockner Ferromatik Desma GmbH: *See*—
Pontius, Klaus; Settinger, Manfred; and Oster, Lothar, 4,678,343, Cl. 366-349.000.

Kluge, Arthur F.; and Wu, Helen Y., to Syntex (U.S.A.) Inc. Novel 8-(lower alkyl)bicyclo[4.2.0]octane derivatives with valuable therapeutic properties. 4,678,805, Cl. 514-510.000.

Knakowski, Rolf; and Fahlbusch, Dieter, to Blaupunkt-Werke GmbH. Car radio theft alarm system. 4,679,026, Cl. 340-63.000.

Knapp, David J.; and Waltz, Marion D., to Aluminum Company of America. Closed loop delivery gauge control in roll casting. 4,678,023, Cl. 164-452.000.

Kneen, Peter W.: *See*—
Cannon, Stuart R.; Brazenor, William J.; Kneen, Peter W.; and Mullen, John L., 4,677,999, Cl. 135-117.000.

Kniepmann, Mark R.: *See*—
Volk, Joseph A., Jr.; and Kniepmann, Mark R., 4,678,424, Cl. 425-331.000.

Knifton, John F.: *See*—
Dureanleau, Roger G.; and Knifton, John F., 4,678,857, Cl. 568-454.000.

Knoll, Peter, to Robert Bosch GmbH. Arrangement for illuminating passive display. 4,679,044, Cl. 340-815.200.

Knop, Klaus: *See*—
Heinrich, Peter; Knop, Klaus; and Rube, Friedbert, 4,678,480, Cl. 48-197.00R.

Knopp, Robert C. Method and means for marking X-ray film with identifying indicia. 4,679,222, Cl. 378-166.000.

Knoth, Werner-Dieter: *See*—
Nebelung, Hermann H.; and Knoth, Werner-Dieter, 4,678,494, Cl. 65-261.000.

Kobari, Yuji; and Miyamoto, Keiichi, to Nissan Motor Co., Ltd. Part time four wheel drive vehicle with road surface condition sensor. 4,678,056, Cl. 180-247.000.

Kobata, Fumihiro: *See*—
Kawabata, Juheiji; Sugie, Toshinori; Kobata, Fumihiro; and Hirayama, Akira, 4,678,831, Cl. 524-496.000.

Kobayashi, Fumio: *See*—
Mitani, Ikujirou; Kawanami, Norihide; and Kobayashi, Fumio, 4,678,261, Cl. 439-582.000.

Kobayashi, Hiroyuki: *See*—
Okada, Takashi; Mogi, Takao; Kobayashi, Hiroyuki; and Ohi, Katsuyuki, 4,679,235, Cl. 380-20.000.

Kobayashi, Kenji: *See*—
Kikuchi, Yoichi; and Kobayashi, Kenji, 4,678,725, Cl. 429-53.000.

Kobayashi, Mikiya; Nakada, Takeshi; and Arai, Michio, to TDK Corporation. Thermal head with invertible heating resistors. 4,679,056, Cl. 346-76.0PH.

Kobayashi, Mituharu, to Kobayashi Tools Mfg. Co., Ltd. Hand-operated cable cutter. 4,677,748, Cl. 30-250.000.

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Koch, Carl, to Sinar AG Schaffhausen. Apparatus for handling light-sensitive photographic sheet material in ambient light. 4,678,302, Cl. 354-107.000.

Koch, Karl C.; and Einolf, Charles W., Jr., to Westinghouse Electric Corp. Resistance to ground checker. 4,679,111, Cl. 361-31.000.

Koczarski, Jack B., to United Technologies Corporation. Adjustable dual drill assembly. 4,678,378, Cl. 408-46.000.

Kohama, Mitsuyoshi: *See*—
Kishi, Toshiaki; and Kohama, Mitsuyoshi, 4,678,223, Cl. 296-78.100.

Kohama, Tokio: *See*—
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,677,850, Cl. 73-204.000.

Kohler Co.: *See*—
Bracht, Jeffrey L.; Heinrich, Martin W.; van Maaren, Richard D.; and Sleder, Richard L., 4,677,940, Cl. 123-2.000.

Kohonen, Raimo: *See*—
Niiranen, Tapani; Savolainen, Erkki; and Kohonen, Raimo, 4,678,574, Cl. 210-327.000.

Koike, Kihachiro: *See*—
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.

Koinuma, Hiroyuki: *See*—
Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, 4,678,934, Cl. 307-279.000.

Koisuka, Mikio; and Aoki, Hisao, to Sanden Corporation. Method for producing a heat exchanger having a flat tube and header pipes. 4,678,112, Cl. 228-138.000.

Koizumi, Haruyuki; and Omae, Koichi, to Omron Tateisi Electronics Co. Keyboard switch. 4,678,880, Cl. 200-340.000.

Kojima, Kazuhisa: *See*—
Shinozaki, Masatoshi; Matsumoto, Yoshihiro; Aoyagi, Yoshiki; and Kojima, Kazuhisa, 4,678,707, Cl. 428-323.000.

Kojima, Toshikuni: *See*—
Yoshimura, Susumu; Kudoh, Yasuo; Tsuchiya, Soji; Kojima, Toshikuni; and Takahashi, Shohzoh, 4,679,124, Cl. 361-433.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,678,371, Cl. 405-164.000.

Komai, Hiromichi: *See*—
Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.

Koman, Ahmet: *See*—
Meyers, Vera K.; and Koman, Ahmet, 4,678,779, Cl. 514-176.000.

Komatsu, Hiroshi; and Nishiguchi, Fumio, to Nissan Motor Co., Ltd. Variable-capacitance radial turbine having swingable tongue member. 4,678,397, Cl. 415-151.000.

Komatsu, Kenji: *See*—
Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, 4,678,934, Cl. 307-279.000.

Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: *See*—
Eckle, Otto, 4,678,382, Cl. 409-232.000.

Komori, Mikio: *See*—
Kato, Yukio; Komori, Mikio; and Yonai, Tadao, 4,677,993, Cl. 131-280.000.

Komori Printing Machinery Co., Ltd.: *See*—
Tsunoda, Teruo, 4,678,336, Cl. 356-380.000.

Kondo, Hiroshi: *See*—
Ohe, Junzo; and Kondo, Hiroshi, 4,679,052, Cl. 343-712.000.

Kondo, Kenji; Katsuyama, Shigeru; Akahane, Shoji; and Tomioka, Kentaro, to G-C Dental Industrial Corp. Color-changeable cement composition for dental use. 4,678,436, Cl. 433-228.100.

Kondo, Shinichi: *See*—
Ogawa, Toshio; Kondo, Shinichi; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,679,176, Cl. 367-119.000.

Kondo, Toshio: *See*—
Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibatani, Juichi, 4,678,064, Cl. 188-73.450.

Kondoh, Masami: *See*—
Oshizawa, Hidekazu; and Kondoh, Masami, 4,679,116, Cl. 361-154.000.
Koninger, Veit: *See*—
Vinnemann, Antonius; and Koninger, Veit, 4,678,993, Cl. 324-208.000.
Konishi, Yasuhiko: *See*—
Ayukawa, Nobuhiro; and Konishi, Yasuhiko, 4,678,518, Cl. 148-6.200.
Konishiroku Photo Industry Co., Ltd.: *See*—
Katsurai, Junji; Monma, Masao; and Takaku, Tetsuo, 4,679,053, Cl. 346-1.100.
Konno, Tetsuro; Kanai, Yutaka; and Fujita, Tetsuya, to Seikosha Co., Ltd. Electrophotographic recording apparatus. 4,678,313, Cl. 355-3.00R.
Konrad Rosenbauer KG.: *See*—
Staudinger, Hermann, 4,678,041, Cl. 169-24.000.
Konstant, Anthony N.; and Weider, John J., to Konstant Products, Inc. Beam to column connection. 4,678,091, Cl. 211-191.000.
Konstant Products, Inc.: *See*—
Konstant, Anthony N.; and Weider, John J., 4,678,091, Cl. 211-191.000.
Kopp, Norbert: *See*—
De Marchi, Jean-Louis; Mabboux, Michel; Paris, Jean; and Kopp, Norbert, 4,677,770, Cl. 36-120.000.
Kornrumpf, William P.: *See*—
Harnden, John D., Jr.; and Kornrumpf, William P., 4,678,957, Cl. 310-332.000.
Korsky, Vincent V.; and Keenan, Ronald M., to Tie/Communications, Inc. Speakerphone sensing circuit. 4,679,228, Cl. 379-165.000.
Koseki, Ryoji, to Amada Engineering Service Co., Inc. Rear mirror holder device for a laser generator. 4,679,204, Cl. 372-107.000.
Koss, Richard E. Basketball return device. 4,678,189, Cl. 273-1.50A.
Kotai, Ferenc: *See*—
Pongratz, Leonhard; Kotai, Ferenc; and Spotzl, Markus, 4,677,894, Cl. 86-45.000.
Kotani, Shozo: *See*—
Usami, Hiroko; Yamamoto, Akihiro; Sugawara, Yutaka; Kotani, Shozo; and Kato, Keijiro, 4,678,773, Cl. 514-25.000.
Kotani, Toshihiro: *See*—
Tada, Koji; Tatsumi, Masami; Kotani, Toshihiro; and Sawada, Shinichi, 4,678,534, Cl. 156-607.000.
Kotitschke, Gerhard; and Horicke, Hans-Werner, to J. M. Voith GmbH. Device for transferring a paper web from the press section to the drying section of a paper machine. 4,677,763, Cl. 34-116.000.
Kowa Company, Ltd.: *See*—
Shiratsuchi, Masami; Kawamura, Kiyoshi; Akashi, Toshihiro; Ishihama, Hiroshi; and Uchida, Yasumi, 4,678,803, Cl. 514-456.000.
Kowalski, David J.: *See*—
Fong, Dodd W.; and Kowalski, David J., 4,678,840, Cl. 525-340.000.
Kowalski, Edward F.: *See*—
Malandra, Louis J.; Leduc, Robert J.; Hankinson, Michael F.; and Kowalski, Edward F., 4,678,623, Cl. 376-260.000.
Kozakai, Shohei: *See*—
Itoh, Kunio; Kozakai, Shohei; Hida, Yoshinori; Okinoshima, Hiroshige; Okada, Fumio; Oba, Toshio; Shimizu, Hisashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,678,688, Cl. 427-387.000.
Kraft, Inc.: *See*—
Marshall, Wayne E.; and Hofmann, Constance J., 4,678,673, Cl. 426-46.000.
Krage, Mark K.: *See*—
Wlodarczyk, Marek T.; Krage, Mark K.; and O'Rourke, Michael J., 4,678,903, Cl. 250-227.000.
Krajewski, Alexander A.: *See*—
Todaro, Frank A.; Castonguay, Roger N.; Krajewski, Alexander A.; and Morris, Robert A., 4,679,019, Cl. 335-172.000.
Kramer, James H., to B. F. Goodrich Company, The. Method for fabricating an elastomeric bearing assembly. 4,677,721, Cl. 29-149.50S.
Kramer, Justin; and Peterson, Richard H. Electrical actuator for percussion instruments. 4,677,892, Cl. 84-405.000.
Kraska, Robert E.; Wilary, Frank J.; and Lessar, Joseph F., to Medtronic, Inc. Hermetic electrical feedthrough assembly. 4,678,868, Cl. 174-152.0GM.
Krause, James N.: *See*—
Wevers, William E.; Krause, James N.; and Battu, Ramgopal, 4,679,102, Cl. 360-75.000.
Krauss-Maffei A.G.: *See*—
Pongratz, Leonhard; Kotai, Ferenc; and Spotzl, Markus, 4,677,894, Cl. 86-45.000.
Krauss, Rudolf: *See*—
Hafner, Udo; Hans, Waldemar; Kind, Wilhelm; Krauss, Rudolf; and Sauer, Rudolf, 4,678,124, Cl. 239-585.000.
Kreuzer, Franz-Heinrich; Eidenschink, Rudolf; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Trialkanoyloxysilanes. 4,678,283, Cl. 350-340.000.
Krieg, Larry M.: *See*—
Richardson, Charles P.; Kuhl, Virgil; Gasparaitis, Bernard; Staple, Bruce; and Krieg, Larry M., 4,679,233, Cl. 379-433.000.
Krill, Jerry A.: *See*—
Irzinski, Edward P.; Krill, Jerry A.; and Zinger, William H., 4,679,008, Cl. 333-21.00R.
Krishnakumar, C. K.; and Schafer, Clyde K., to Chamberlain Manufacturing Corporation. Water heater. 4,678,116, Cl. 236-25.00A.
Kritchevsky, Gina R.; Gregor, John A.; Gruendig, Manfred W.; Sellers, Gregory J.; and Liss, Barbara, to Allied Corporation. Stampable polymeric composite containing an EMI/RFI shielding layer. 4,678,699, Cl. 428-175.000.
Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., to Eotec Corporation. Optoelectronic rotational position sensor. 4,679,029, Cl. 340-347.00P.
Kronogard, Hakan; and Selberg, Roberto. Golf swing training device. 4,678,193, Cl. 273-186.00C.
Kroy Inc.: *See*—
Richardson, Michael M.; and Schaffer, Douglas A., 4,678,353, Cl. 400-248.000.
Krueger, Gerald G., to University of Utah Research Foundation. Methods of testing the reaction of various substances on living human skin. 4,677,968, Cl. 128-1.00R.
Kruger, Bernd-Wieland; Hoffmann, Hellmut; Roos, Ernst; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Pest-combating agents containing phosphorus-heterocyclic compounds. 4,678,777, Cl. 514-110.000.
Kruger, Hans-Rudolf: *See*—
Franke, Helga; Franke, Heinrich; Kruger, Hans-Rudolf; and Joppien, Hartmut, 4,678,811, Cl. 514-721.000.
Kruse, Hubert: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, 4,678,476, Cl. 8-639.000.
Kryder, Mark H.; and Shieh, Han-Ping D., to General Electric Company. Process for direct over-writing of digital data recorded on magneto-optical recording media. 4,679,180, Cl. 369-13.000.
Krzyanowski, Robert V.: *See*—
Eder, Kenneth C.; and Krzyanowski, Robert V., 4,679,175, Cl. 367-98.000.
Ksander, Gary M.: *See*—
Stanton, James L.; and Ksander, Gary M., 4,678,800, Cl. 514-412.000.
Kubelbock, Alfred: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
Kubo, Jun, to Nissan Motor Company, Limited. Anti-skid brake control system and method featuring vehicle battery protection. 4,679,146, Cl. 364-426.000.
Kubota Ltd.: *See*—
Tone, Masatsugu, 4,677,866, Cl. 74-15.860.
Kubota, Yuichi: *See*—
Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, 4,678,708, Cl. 428-336.000.
Kuboyama, Nobuyoshi. Rotary means for use as a heat source. 4,678,400, Cl. 415-199.400.
Kudo, Takashi: *See*—
Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, 4,678,054, Cl. 180-225.000.
Kudoh, Yasuo: *See*—
Yoshimura, Susumu; Kudoh, Yasuo; Tsuchiya, Soji; Kojima, Toshikuni; and Takahashi, Shohzoh, 4,679,124, Cl. 361-433.000.
Kuester, James L., to Arizona Board of Regents. Process of producing liquid hydrocarbon fuels from biomass. 4,678,860, Cl. 585-14.000.
Kuhfuss, Runwalt, to De La Rue Giori S.A. Process for processing security paper webs or security paper sheets to form bundles of security papers. 4,677,910, Cl. 101-93.010.
Kuhl, Virgil: *See*—
Richardson, Charles P.; Kuhl, Virgil; Gasparaitis, Bernard; Staple, Bruce; and Krieg, Larry M., 4,679,233, Cl. 379-433.000.
Kuhn, Reinhard: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, 4,678,476, Cl. 8-639.000.
Kullen, Albrecht, to Braun Aktiengesellschaft. Hair dryer with axial blower. 4,678,410, Cl. 417-423.00R.
Kumagai, Yoshihiro: *See*—
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.
Kumar, Manoj: *See*—
Dias, Daniel M.; Kumar, Manoj; Lien, Yeong-Chang L.; and Maruyama, Kiyoshi, 4,679,190, Cl. 370-60.000.
Kumata, Kiyoshi: *See*—
Sekimoto, Yoshihiro; Terashima, Shigeo; Kumata, Kiyoshi; and Tanaka, Toshiyuki, 4,678,276, Cl. 350-247.000.
Kumiai Chemical Industry Co., Ltd.: *See*—
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,678,496, Cl. 71-76.000.
Kunihiro, Masashi: *See*—
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
Kuniya, Keiichi: *See*—
Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.
Kuraray Company, Ltd.: *See*—
Yoshizawa, Tamae; Otsuka, Kiyoto; Nagata, Shiro; and Takamatsu, Hideo, 4,678,841, Cl. 525-353.000.
Kurokawa, Toshio, to Fuji Photo Film Co., Ltd. Multiple magnetic pump system. 4,678,409, Cl. 417-420.000.

Kuroki, Takanori. Heat exchanger structure and method of manufacturing same. 4,677,724, Cl. 29-157.30R.

Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, to Sanwa Kagaku Kenkyusho Co., Ltd. Novel 2-oxopyrrolidine compounds, salts thereof process for the preparation thereof as well as pharmaceutical agent comprising the compound. 4,678,801, Cl. 514-413.000.

Kurt Allert GmbH & Co. KG: *See*—
Allert, Kurt, 4,677,712, Cl. 24-274.00R.

Kurz, Erich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Electrical cooling fan. 4,677,941, Cl. 123-41.120.

Kurz, Walter, to Electrohome Limited. Regulation of picture size with varying scan frequency. 4,679,211, Cl. 315-399.000.

Kusano, Shoji: *See*—
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,678,496, Cl. 71-76.000.

Kushida, Takeo, to Diesel Kiki Co., Ltd. High speed electromagnetic valve. 4,678,000, Cl. 137-1.000.

Kuwata, Yutaka: *See*—
Sakakibara, Kazuhiko; and Kuwata, Yutaka, 4,679,129, Cl. 363-17.000.

KW Battery Company: *See*—
Eggers, Mark L., 4,678,730, Cl. 429-140.000.

Kwech, Horst; and Olson, Peter K., to E. H. Wachs Company, The. Portable end prep lathe. 4,677,884, Cl. 82-4.00C.

LaBarge, Robert L.; and Maier, Frank E., to Aluminum Company of America. Integral rivet. 4,678,096, Cl. 220-273.000.

Laboratoire Central des Ponts et Chausses: *See*—
Belluteau, Jean-Pierre; Bocard, Christian; Such, Christian; and Vaillant, Daniel, 4,678,558, Cl. 208-390.000.

Labrum, Joseph H.: *See*—
Nielsen, Max E.; Labrum, Joseph H.; and Grant, Patrick S., 4,679,215, Cl. 377-95.000.

Labsystems Oy: *See*—
Harjunmaa, Hannu, 4,678,326, Cl. 356-73.000.

Lacey, James J. Pump prime maintainer. 4,678,001, Cl. 137-194.000.

Lacher, Ludwig: *See*—
Eichenberger, Hansulrich; Lacher, Ludwig; and Schmid, Titus, 4,677,710, Cl. 19-218.000.

Lagushenko, Radomir I.: *See*—
Bouchard, Andre C.; Thibault, Paul A.; and Lagushenko, Radomir I., 4,678,520, Cl. 148-6.350.

Lahr, Helfrid; and Pontani, Bernd, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Method for loading fuel rods into a container. 4,678,624, Cl. 376-261.000.

Laing, John R.; Zimmer, C. D.; Maniar, Deepak R.; and Williams, Meurig W., to Xerox Corporation. Process for developer compositions. 4,678,734, Cl. 430-137.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Rignon, Maurice; Catonne, Jean-Claude; Denisard, Francoise; and Malafosse, Jean, 4,678,549, Cl. 204-74.000.

Lally, Thomas P., to Raychem Corporation. Sonar detection apparatus. 4,679,179, Cl. 367-162.000.

Lambert, Jean-Pierre: *See*—
Chabrol, Jean-Jacques; and Lambert, Jean-Pierre, 4,678,233, Cl. 297-429.000.

Lambourn, Robert G. Aerated live bait bucket. 4,677,785, Cl. 43-55.000.

Lancaster, Gerald M.; and Allen, James A., to Dow Chemical Company, The. Co-extruded laminates containing carbon monoxide interpolymers. 4,678,713, Cl. 428-421.000.

Lancaster, Robert L.; and Shaw, Raymond E., to Petro Products, Inc. Protective laminate. 4,678,702, Cl. 428-252.000.

Landa, Benzion, to Savin Corporation. Registering method. 4,678,177, Cl. 271-238.000.

Landheer, Dolf: *See*—
McCallum, Robert S.; Plasschaert, Paul E.; Landheer, Dolf; and Gandhi, Hemant M., 4,679,060, Cl. 346-159.000.

Landis, John M.: *See*—
Douty, George H.; and Landis, John M., 4,678,121, Cl. 439-610.000.

Landoll, Leonard: *See*—
Purvis, Gene; Phelps, Russell; Dupler, Tim; Landoll, Patrick; and Landoll, Leonard, 4,678,010, Cl. 138-31.000.

Landoll, Patrick: *See*—
Purvis, Gene; Phelps, Russell; Dupler, Tim; Landoll, Patrick; and Landoll, Leonard, 4,678,010, Cl. 138-31.000.

Landrum, Clyde L.: *See*—
Alling, Richard L.; Shepard, Richard W.; Landrum, Clyde L.; Tofield, Robert H.; and Podhajecki, Stephen T., 4,677,720, Cl. 29-148.40C.

Landry, Norman R.: *See*—
Reese, Robert M.; and Landry, Norman R., 4,678,863, Cl. 174-35.0GC.

Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Mallory, Chester L., to Prometrix Corporation. Process control interface system for designer and operator. 4,679,137, Cl. 364-188.000.

Lane, Maxwell Victor: *See*—
Lewellin, Richard L., 4,678,822, Cl. 524-12.000.

Lang, Franz J., to Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung. Display stand. 4,678,089, Cl. 211-133.000.

Lange International S.A.: *See*—
Arieh, Simon; and Courvoisier, Guy, 4,677,771, Cl. 36-120.000.

Langenbach, George F., Jr., to Perma-Jack Company. Apparatus for and method of shoring a structure. 4,678,373, Cl. 405-230.000.

Lanier, Jean-Pierre R.; and Marie, Georges P. Device for marking presence, reservation or information. 4,677,776, Cl. 40-15.00R.

LaPlante, Dale, to BEI Electronics, Inc. Zero reference generating method and apparatus for optical encoders. 4,678,908, Cl. 250-231.0SE.

Lapsker, Itzchak, to GBI International Industries, Inc. Method and apparatus for high tolerance polishing of a workpiece surface. 4,677,793, Cl. 51-251.000.

Larck, William A.: *See*—
Atkins, Kenneth E.; Gandy, Raymond C.; and Larck, William A., 4,678,711, Cl. 428-414.000.

Lari, Robert J.: *See*—
Hull, John R.; Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., 4,678,024, Cl. 164-503.000.

Larribe, Lucien: *See*—
Charonnat, Yves; and Larribe, Lucien, 4,678,364, Cl. 404-105.000.

Larsen, Eigil; Lien, Eldar; and Snook, Clive, to Geophysical Company of Norway A.S. Arrangement in hydrophone. 4,679,178, Cl. 367-157.000.

Larson, Donald A.; and Runyon, Peter M., to North States Industries, Inc. Adjustable gate for doorways. 4,677,791, Cl. 49-463.000.

Larson, Eric R.; and Siegel, Todd W., to Pfizer Inc. Ligands for affinity chromatographic purification of aldose reductase. 4,678,749, Cl. 435-183.000.

Larson, Goran: *See*—
Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettgen, Herbert F., 4,678,747, Cl. 435-7.000.

Larson, Jeffrey G.: *See*—
King, Raymond A.; Larson, Jeffrey G.; and Walton, Lewis A., 4,678,630, Cl. 376-438.000.

Laser Metric Systems, Inc.: *See*—
Cohen, David A.; and Papurt, David M., 4,678,337, Cl. 356-387.000.

Lassaux, Jean; and Dagorn, Christian, to Telecommunications Radioelectriques et Telephoniques T.R.T. Echo canceller and center clipper control arrangement. 4,679,230, Cl. 379-411.000.

Laue, Hans-Bodo, to Nixdorf Computer AG. Output circuit for signal transmission systems. 4,678,939, Cl. 307-445.000.

Lauria, Vincent A., to National Starch and Chemical Corporation. Remoistenable adhesive compositions. 4,678,824, Cl. 524-48.000.

Lavigne, Ronald L. Treatment system for landfill leachate. 4,678,582, Cl. 210-150.000.

Lawrenson, Glen A.: *See*—
Finger, John F.; and Lawrenson, Glen A., 4,678,892, Cl. 219-272.000.

Layher, Francis W., to National Semiconductor Corporation. Glass compression seals using low temperature glass. 4,678,358, Cl. 403-28.000.

Lazzaro, Joseph: *See*—
Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.

Le, Quang N.; Tsao, Ying-Yen P.; and Wong, Stephen S., to Mobil Oil Corporation. Reactivation of noble metal-zeolite catalysts. 4,678,764, Cl. 502-26.000.

Lea, Chin-Tau A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Alternate self-routing packet switching node having fault detection capabilities. 4,679,186, Cl. 370-14.000.

Leahan, Daniel P. Pen and note pad. 4,678,206, Cl. 281-15.00B.

Lectron Products, Inc.: *See*—
Northman, Bradley L.; Slavin, Michael; and West, Donald J., 4,678,006, Cl. 137-596.170.

Leduc, Robert J.: *See*—
Malandra, Louis J.; Leduc, Robert J.; Hankinson, Michael F.; and Kowalski, Edward F., 4,678,623, Cl. 376-260.000.

Lee, Anthony: *See*—
Nagel, Gregory L.; Lee, Anthony; and Hill, Warren D., 4,678,887, Cl. 219-117.100.

Lee, Denny L. Y., to E.I. du Pont de Nemours and Company. Radioactive material billing system and method. 4,679,142, Cl. 364-406.000.

Lee, Donald M., to Ashland Oil, Inc. Ballistic separation of particles in a progressive flow reactor. 4,678,642, Cl. 422-144.000.

Lee, Joseph L., to Mossberg & Sons, Inc. Retrofit firearm. 4,677,781, Cl. 42-70.010.

Lee, Wen-Hsin. Cork screw. 4,677,883, Cl. 81-3.370.

Lefevre, Pierre: *See*—
Tytgat, Daniel; and Lefevre, Pierre, 4,678,541, Cl. 156-664.000.

Lehmann, Peter, to Mannesmann Aktiengesellschaft. Pipe pig with running gear. 4,677,865, Cl. 73-866.500.

Lehnhoff, Richard N.; and Savage, Jack W., to General Motors Corporation. Self-starting single-phase brushless DC motor and control therefor. 4,678,972, Cl. 318-254.000.

Lehtikoski, Olavi; and Nissinen, Martti. Apparatus for measuring optical properties of paper. 4,678,325, Cl. 356-73.000.

Leiber, Heinz, to Robert Bosch GmbH. Method and apparatus for controlling brake pressure in vehicle brake systems. 4,678,243, Cl. 303-114.000.

Leininger, Jon J. Air motor having integral generator. 4,678,922, Cl. 290-54.000.

Leipold, Michael: *See*—
Sommerer, Jurgen; Leipold, Michael; Kainer, Hartmut; and Stein, Hermann, 4,677,731, Cl. 29-526.00R.

Leja, Andrzej: *See*—
Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, 4,677,964, Cl. 126-41.00R.

Le Magourou, Yves, to Societe d'Exploitation des Procedes Marechal (SEPM). High intensity power plug. 4,678,254, Cl. 439-139.000.

Lemper, Herbert, to Kabushiki Kaisha Kobe Seiko Sho. Mold-oscillating apparatus in a continuous casting assembly. 4,678,022, Cl. 164-416.000.

Lemper, Herbert, to Kabushiki Kaisha Kobe Seiko Sho. Tundish car in a continuous casting assembly. 4,678,167, Cl. 266-165.000.

Lenard, Peter: *See*—
Beck, Ernst; Lenard, Peter; and Hutzel, Hans, 4,677,882, Cl. 76-77.000.

Lenz, Werner; and Most, Manfred, to Suddeutsche Kuhlerfabrik Julius Fr Behr GmbH & Co. Cooler for a water cooled internal combustion engine. 4,678,026, Cl. 165-67.000.

Leonardi, David. Method and apparatus for immobilizing an eyelid. 4,677,974, Cl. 128-163.000.

Leoncavallo, Richard A., to Nalge Company. Reusable filter unit with recoverable filter membrane. 4,678,576, Cl. 210-433.200.

Leopold, Kurt E.: *See*—
Taylor, Roderick S.; and Leopold, Kurt E., 4,679,203, Cl. 372-86.000.

Leroy, Yves: *See*—
Constant, Eugene; Leroy, Yves; and Van De Velde, Jean-Claude, 4,677,988, Cl. 128-736.000.

Lessar, Joseph F.: *See*—
Kraska, Robert E.; Wilary, Frank J.; and Lessar, Joseph F., 4,678,868, Cl. 174-152.0GM.

Lester, James N., to GTE Products Corporation. High intensity discharge lamp starting and operating apparatus. 4,678,968, Cl. 315-290.000.

Lester, Leslie J.: *See*—
Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., 4,677,813, Cl. 56-13.900.

Levin, Richard I.: *See*—
Cox, Michael W.; Levin, Richard I.; Cohen, David J.; and Frisbie, William R., 4,679,144, Cl. 364-417.000.

Levine, Gerald B.: *See*—
Schwerdt, Kurt R.; and Levine, Gerald B., 4,678,969, Cl. 315-382.000.

Levitt, George: *See*—
Hay, James V.; and Levitt, George, 4,678,500, Cl. 71-92.000.

Lewellin, Richard L., to Lane, Maxwell Victor; and Kaddis, George. Resin impregnated fibre batt. 4,678,822, Cl. 524-12.000.

Lewiner, Jacques; and Hennion, Claude. Processes and devices for reading magnetic access control cards or similar. 4,678,897, Cl. 235-436.000.

Liba Maschinenfabrik GmbH: *See*—
Wunner, Roland, 4,677,831, Cl. 66-84.00A.

Lien, Eldar: *See*—
Larsen, Eigil; Lien, Eldar; and Snook, Clive, 4,679,178, Cl. 367-157.000.

Lien, Shui-Chih A.: *See*—
Yaniv, Zvi; Chapelle, Walter E.; Lien, Shui-Chih A.; and Yang, Mohshi, 4,678,282, Cl. 350-334.000.

Lien, Yeong-Chang L.: *See*—
Dias, Daniel M.; Kumar, Manoj; Lien, Yeong-Chang L.; and Maruyama, Kiyoshi, 4,679,190, Cl. 370-60.000.

Life Light Systems: *See*—
Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., 4,678,450, Cl. 446-405.000.

Light, Gerard M., to Eaton Corporation. Fluid coupling device having improved heat dissipation. 4,678,070, Cl. 192-58.00B.

Lillquist, Robert D.; Pimbley, Joseph M.; and Vogelsong, Thomas L., to General Electric Company. Composite visible/thermal-infrared imaging system. 4,679,068, Cl. 358-44.000.

Lin, Hsiu H.: *See*—
Belke, Robert E., Jr.; Shirk, Raymond A.; Lin, Hsiu H.; and Zakraysek, Louis, 4,679,122, Cl. 361-414.000.

Lin, Steve: *See*—
Owen, Charles B.; Owen, Charles C.; and Lin, Steve, 4,678,014, Cl. 141-67.000.

Lindemann, Peer, to Rolyan Manufacturing Co. Inc. Adjustable wrist splint. 4,677,971, Cl. 128-87.00R.

Ling Electronics Inc.: *See*—
Butts, Gary; Sydo, Lukas; and Rossi, Victor L., 4,678,347, Cl. 384-43.000.

Link, Helmut F., to Index-Werke Komm.-Ges. Hahn & Tessky. Tool holding device for lathes. 4,677,719, Cl. 29-40.000.

Lion Corporation: *See*—
Nakamura, Kazuhito; Sasaki, Hisami; Chigira, Masayoshi; and Yokoi, Kenji, 4,678,590, Cl. 252-8.800.

Lipski, Jerzy A.; and Bardsley, Ian R., to Microtel Limited. Optical scanner and sensor for monitoring power consumption. 4,678,907, Cl. 250-231.0SE.

Lisowyj, Bohdan; Hitchcock, David C.; and Epstein, Henry, to Enron Corp. Process for the recovery of gallium and germanium from coal fly ash. 4,678,647, Cl. 423-96.000.

Liss, Barbara: *See*—
Kritchevsky, Gina R.; Gregor, John A.; Gruendig, Manfred W.; Sellers, Gregory J.; and Liss, Barbara, 4,678,699, Cl. 428-175.000.

Lithium Corporation of America, Inc.: *See*—
Kamienski, Conrad W.; and Dover, B. Troy, 4,678,614, Cl. 260-665.00R.

Litvinoff, Jerome S. Rescue vehicle. 4,677,896, Cl. 89-36.080.

Litzinger, Elmer F.: *See*—
Denier, Robert F.; Marshall, Robert H.; Jewell, John N.; and Litzinger, Elmer F., 4,677,994, Cl. 131-310.000.

Liu, Marie W.; and Ho, Victor, to Ciba-Geigy Corporation. Heat-curable mixture containing substituted bicyclo(2.2.1)hept-5-ene-2,3-dicarboximide and polymaleimide. 4,678,849, Cl. 526-259.000.

Liutkus, John J.: *See*—
Hatzakis, Michael; Liutkus, John J.; Paraszczak, Jurij R.; and Shaw, Jane M., 4,678,850, Cl. 526-293.000.

LJS Practice Management Limited: *See*—
Simon, Lewis A.; and Scarffe, Michael F., 4,677,756, Cl. 33-514.000.

Llinas, Rodolfo R.; Sugimori, Mutsuyuki; and Crank, Ronald K., to New York University. Infrared transcutaneous communicator and method of using same. 4,677,982, Cl. 128-664.000.

Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettgen, Herbert F., to Sloan-Kettering Institute. Monoclonal antibodies for detection of an H (O) blood group antigen. 4,678,747, Cl. 435-7.000.

Loce, Robert P.; and Deibler, Melvin E., to Xerox Corporation. Multimagnification short focal length imaging system. 4,678,311, Cl. 355-1.000.

Lockheed Corporation: *See*—
Sparling, Kenneth P.; Richardson, David G.; Incardona, Angelo; Wood, Ronald E.; Kikendall, Garth D.; and Bakow, Leon, 4,678,384, Cl. 411-43.000.

Loctite Corporation: *See*—
Gelinas, William A.; and McDermott, Robert N., 4,678,100, Cl. 222-52.000.

Loeb, Jonathon T.: *See*—
Arldt, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., 4,678,175, Cl. 271-34.000.

Loeliger, Peter: *See*—
Klaus, Michael; and Loeliger, Peter, 4,678,793, Cl. 514-311.000.

LogE/Dunn Instruments, Inc.: *See*—
Torrano, Michael A., Jr.; Lyon, George E.; and Haddick, David H., 4,679,087, Cl. 358-168.000.

Loggers, John J. Collision risk assessment system. 4,677,753, Cl. 33-264.000.

Logie, Frank M., to Lucas Industries public limited company. Winding method. 4,677,743, Cl. 29-596.000.

Logullo, Francis M., Sr.; Wu, Yun-Tai; and Zahr, George E., to Du Pont de Nemours, E. I., and Company. Composites. 4,678,821, Cl. 523-205.000.

Logwood, Dennis J.; Haq, Mohammed E. U.; Reed, John A.; and Karp, Joel A., to Visic, Inc. MOS/CMOS memory cell. 4,679,171, Cl. 365-154.000.

Lohmar, Elmar: *See*—
Muller, Heinz; Lohmar, Elmar; and Scholz, Harald, 4,678,482, Cl. 55-71.000.

Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, to Weber-Stephen Products Co. Portable gas grill. 4,677,964, Cl. 126-41.00R.

Lohr & Bromkamp GmbH: *See*—
Aucktor, Erich; and Gartner, Gunter, 4,678,453, Cl. 464-144.000.

Loiacono, Gabriel M.: *See*—
Shone, Michael F.; and Loiacono, Gabriel M., 4,679,198, Cl. 372-41.000.

Long, Harry A. Temporary dental crown and method of forming the same. 4,678,435, Cl. 433-218.000.

Long, Stuart G.; and Maciocia, Michael J., to General Dyanmics, Pomona Division. Method of making packing material with antistatic coating. 4,677,809, Cl. 53-427.000.

Lonsdale, Randall J.; and Hellekson, Ronald A., to Spectra-Physics, Inc. Trifocal lens for a laser instrument. 4,678,288, Cl. 350-432.000.

Loos, Herbert; and Erhardt, Manfred, to Carl Hurth Machinen- und Zahnradfabrik GmbH & Co. Gearlike tool for dressing abrasive, gearlike, precision machining tools. 4,677,962, Cl. 125-11.0CD.

L'Oreal: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,678,665, Cl. 424-72.000.

Lorett, Jerzy A.; and Vandevier, Joseph E., to Hughes Tool Company. Low volume variable rpm submersible well pump. 4,678,404, Cl. 417-45.000.

Loriot, Pierre; Rendu, Michel; Rousseau, Jean; and Samoel, Alain, to Commissariat a l'Energie Atomique. Method of setting a stop means inside of a tubular element. 4,678,924, Cl. 29-407.000.

Losch, Hans-Wilhelm; Kleinrahm, Rainer; Pieperbeck, Norbert; and Wagner, Wolfgang. Apparatus for the contactless coupling of a suspended part to force measuring device. 4,678,048, Cl. 177-212.000.

Loss, Rolf D.: *See*—
Reichardt, Manfred; and Loss, Rolf D., 4,678,262, Cl. 439-857.000.

Lovsland, Arnstien: *See*—
Stole, Kjell A.; Lovsland, Arnstien; and Havig, Egil, 4,678,560, Cl. 209-23.000.

Lowe, Virginia L. Pan insert. 4,677,906, Cl. 99-450.000.

Lu, Zhi-kang: *See*—
Zhang, Yun-xiang; Dai, Xing-yi; Lu, Zhi-kang; and Zeng, Sen, 4,678,847, Cl. 526-206.000.

Lubchenko, Eugene: *See*—
Andrea, Johan; Lubchenko, Eugene; and Bradley, Ralph H., 4,679,069, Cl. 358-60.000.

Lubet, Carl; and Spector, George. Beachrunners. 4,677,765, Cl. 36-1.500.

Lucas Industries Public Limited Company: *See—*
Erben, Ralf; and Walden, Michael F. M., 4,678,065, Cl. 188-196.00D.
Logie, Frank M., 4,677,743, Cl. 29-596.000.
Morris, Clive A.; and Joby, Michael J., 4,679,151, Cl. 364-510.000.
Thompson, Richard E., 4,678,067, Cl. 188-328.000.

Luke, John A., to Brown & Williamson Tobacco Corporation. Smoking article mouthpieces. 4,677,996, Cl. 131-336.000.

Luke, Robert R.; Barker, James M.; Smith, Michael L.; Grigar, Larry L.; and Miller, Carl B., to Halliburton Company. Tubing pressure operated initiator for perforating in a well borehole. 4,678,044, Cl. 175-4.520.

Lukis, Lawrence J., to Moore Business Forms, Inc. Method and apparatus for correcting x-y position measurements. 4,679,241, Cl. 382-13.000.

Lukowski, Frank J., Jr.; and Hammill, Harry B., III, to Calspan Corporation. Automatically guided vehicle control system. 4,678,329, Cl. 356-152.000.

Luks Industrial Company Ltd.: *See—*
Wong, Hoi W.; and Chai, Hung Y., 4,679,078, Cl. 380-15.000.

Lundberg, Peter, to Eur-Control Kalle AB. Method of measuring and regulating the concentration of a fibre suspension and a device for carrying out the method. 4,677,846, Cl. 73-63.000.

Lunk, Hans E.: *See—*
Tondre, Stephen L.; and Lunk, Hans E., 4,678,709, Cl. 428-380.000.

Luxtron Corporation: *See—*
Phillips, Stephen R., 4,678,905, Cl. 250-227.000.

Lybeck, Lynn V.: *See—*
Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Mallory, Chester L., 4,679,137, Cl. 364-188.000.

Lymer, Donald A.: *See—*
Bartlett, Ian G.; and Lymer, Donald A., 4,678,533, Cl. 156-435.000.

Lynch, Daniel; and Perry, Steven B., to Keptel, Inc. Telephone line testing circuit. 4,679,224, Cl. 379-26.000.

Lyon, George E.: *See—*
Torrano, Michael A., Jr.; Lyon, George E.; and Haddick, David H., 4,679,087, Cl. 358-168.000.

Lyons, William C. Turbine tool. 4,678,045, Cl. 175-61.000.

M/A-COM, Inc.: *See—*
Cloutier, Donald C., 4,679,009, Cl. 333-21.00A.

M.A.N. Maschinenfabrik Augsburg-Nurnberg AG: *See—*
Heinrich, Peter; Knop, Klaus; and Rube, Friedbert, 4,678,480, Cl. 48-197.00R.

Maack, David R.: *See—*
Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., 4,679,029, Cl. 340-347.00P.

Mabboux, Michel: *See—*
Benoit, Louis; Mabboux, Michel; Nerrinck, Bernard; and De Marchi, Jean-Louis, 4,677,768, Cl. 36-117.000.
De Marchi, Jean-Louis; Mabboux, Michel; Paris, Jean; and Kopp, Norbert, 4,677,770, Cl. 36-120.000.

MacAvoy, David W.: *See—*
Gallusser, David O.; Brush, Robert W., Sr.; and MacAvoy, David W., 4,678,260, Cl. 439-607.000.

Macchi, Ercole. Valve assembly structure for steam flatirons. 4,677,774, Cl. 38-77.830.

Maciocia, Michael J.: *See—*
Long, Stuart G.; and Maciocia, Michael J., 4,677,809, Cl. 53-427.000.

Maciolek, Joseph R.: *See—*
Bradford, Michael P.; and Maciolek, Joseph R., 4,678,401, Cl. 416-32.000.

MacKenzie, Morley S.: *See—*
Finn, Roger C.; and MacKenzie, Morley S., 4,678,272, Cl. 350-96.210.

Maddock, William H.; and Bobrovniczky, Bert, to Noma Inc. Trouble lamp and retainer. 4,678,153, Cl. 248-229.000.

Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegasi, Takasi; and Yamaoka, Isao, to Sapporo Breweries, Ltd. Coating device for cold bottles or like containers. 4,677,934, Cl. 118-58.000.

Maeda, Keini: *See—*
Sadamori, Yuuichi; and Maeda, Keini, 4,679,045, Cl. 340-825.070.

Maeda, Mitsutosho: *See—*
Hirano, Takahisa; Fukami, Shoji; and Maeda, Mitsutosho, 4,678,416, Cl. 418-55.000.

Maeda, Morio: *See—*
Saitoh, Hajime; and Maeda, Morio, 4,678,883, Cl. 219-10.61R.

Maeno, Kunio; and Kisanuki, Hisayuki, to Toyoda Gosei Co., Ltd. Weather strip. 4,678,696, Cl. 428-122.000.

Mager, Eric L., to GTE Products Corporation. Fluorescent lamp having two phosphor layers. 4,678,966, Cl. 313-487.000.

Magin, Berthold, to MTM Obermaier GmbH & Co. KG. Device for continuous and tension-free treatment of textile. 4,677,717, Cl. 26-18.500.

Magna International Inc: *See—*
Fisher, Robert J., 4,678,295, Cl. 350-634.000.

Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, to Kabushiki Kaisha Toshiba. Flip-flop circuit. 4,678,934, Cl. 307-279.000.

Mahnke, Parker E., to Marcy Gymnasium Equipment Co. Exercise apparatus. 4,678,185, Cl. 272-134.000.

MAHO Werkzeugmaschinenbau Babel & Co.: *See—*
Babel, Werner, 4,677,718, Cl. 29-33.00P.

Mahon, Joseph J., to Eaton Corporation. Microwave oven timer. 4,678,930, Cl. 307-141.000.

Maier, Frank E.: *See—*
LaBarge, Robert L.; and Maier, Frank E., 4,678,096, Cl. 220-273.000.

Maier, Peter; and Hansel, Gernot. Guide arrangement for a portable power saw. 4,677,750, Cl. 30-376.000.

Maker, Lewis W.; and Nicholson, Horace, to United States Supply Company. Shipping container for packaging endless belts for transportation or storage. 4,678,084, Cl. 206-597.000.

Maki, Hideo: *See—*
Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.

Makimoto, Mitsuo: *See—*
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,679,003, Cl. 331-1.00A.

Makishima, Tokuo: *See—*
Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihiro; and Makishima, Tokuo, 4,678,767, Cl. 502-104.000.

Malaby, Davey L.: *See—*
Bantz, David F.; Malaby, Davey L.; and Sholtz, Paul N., 4,679,038, Cl. 340-721.000.

Malafosse, Jean: *See—*
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Malhi, Satwinder D. S., to Texas Instruments Incorporated. Method of providing buried contacts for N and P channel devices in an SOI-CMOS process using a single N+polycrystalline silicon layer. 4,677,735, Cl. 29-571.000.

Malhotra, Satish K., to Steyr-Daimler-Puch AG. Hand firearm. 4,677,898, Cl. 89-187.010.

Malhotra, Shadi L., to Xerox Corporation. Thermal transfer printing sheets containing certain coating compositions thereof. 4,678,687, Cl. 427-261.000.

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Mallory, Chester L.: *See—*
Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Mallory, Chester L., 4,679,137, Cl. 364-188.000.

Malloy Desormeaux, Stephen G., to Eastman Kodak Company. Film-on-spool sensor for determining mode of operation of film transport mechanism in camera. 4,678,303, Cl. 354-173.110.

Maloney, Christopher E.; and Crane, Russell M. Gas laser tube apparatus. 4,679,202, Cl. 372-65.000.

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Mancinelli, Paul A., to Atlantic Richfield Company. Multilithium polymerization initiators. 4,678,837, Cl. 525-250.000.

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Mang, Hermenegild; and Engel, Gunter, to Avl Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbH. Process for producing crystals. 4,678,535, Cl. 156-623.00R.

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Laing, John R.; Zimmer, C. D.; Maniar, Deepak R.; and Williams, Meurig W., 4,678,734, Cl. 430-137.000.

Mannesmann Aktiengesellschaft: *See—*
Lehmann, Peter, 4,677,865, Cl. 73-866.500.

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Dantlgraber, Jorg, 4,678,412, Cl. 418-26.000.
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Manning, David T., to Union Carbide Corporation. Certain pyrazinyl 1,3 cycloalkanedione derivatives having herbicidal activity. 4,678,501, Cl. 71-92.000.

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Mahnke, Parker E., 4,678,185, Cl. 272-134.000.

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Lanier, Jean-Pierre R.; and Marie, Georges P., 4,677,776, Cl. 40-15.00R.

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Sykes, Donald J., 4,678,617, Cl. 264-25.000.

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Sood, Ajay; and Marra, Robert A., 4,678,657, Cl. 423-600.000.

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Denier, Robert F.; Marshall, Robert H.; Jewell, John N.; and Litzinger, Elmer F., 4,677,994, Cl. 131-310.000.

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Martenas, Wayne B., to New Holland Inc. Quick adjust shear bar mechanism. 4,678,130, Cl. 241-222.000.

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Punzar, Marianne; Marti, Franz; Mercier, Robert; Tobler, Paul; and Buttiker, Rudolf, 4,678,852, Cl. 544-194.000.

Martien, James C.: *See*—
Voinche, Jack L.; and Martien, James C., 4,678,587, Cl. 210-748.000.

Martin, Leonard G. Band saw stand. 4,677,887, Cl. 83-788.000.

Marulic, Walter J.: *See*—
Baker, William R.; Marulic, Walter J.; and Robertson, James C., 4,677,918, Cl. 105-378.000.

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Dias, Daniel M.; Kumar, Manoj; Lien, Yeong-Chang L.; and Maruyama, Kiyoshi, 4,679,190, Cl. 370-60.000.

Maryatt, Christopher J. Head positioning assembly for a disk drive. 4,679,105, Cl. 360-97.000.

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Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.

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Eichenberger, Hansulrich; Lacher, Ludwig; and Schmid, Titus, 4,677,710, Cl. 19-218.000.

Mason, Robert K.: *See*—
Simonton, R. D.; Cattano, John D.; and Mason, Robert K., 4,678,729, Cl. 429-129.000.

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Kelland, David R., 4,678,478, Cl. 44-1.0SR.
Willson, Richard C., III; Bulot, Eric; and Cooney, Charles L., 4,678,583, Cl. 210-638.000.

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Mastandrea, Frank. Support for tomato plants and the like. 4,677,788, Cl. 47-47.000.

Masuda, Ikuro: *See*—
Uragami, Akira; Suzuki, Yukio; Kadono, Shinji; Iwamura, Masahiro; Masuda, Ikuro; and Yamauchi, Tatsumi, 4,678,943, Cl. 307-473.000.

Masunaga, Makoto; Muramoto, Tomotaka; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Color image pickup device. 4,679,066, Cl. 358-29.000.

Masuyama, Kenichi: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; Okutu, Toshimitu; Masuyama, Kenichi; and Nasu, Norio, 4,678,697, Cl. 428-141.000.

Mathews, J. F., III. Construction utilizing a passive air system for the heating and cooling of a building structure. 4,677,903, Cl. 98-31.000.

Mathews, Linden H.; and Crabb, Douglas R. Fastening device and method. 4,677,795, Cl. 52-63.000.

Matsue, Hiroshi: *See*—
Sakimoto, Seiichiro; Fujita, Kazuo; Yamauchi, Yutaka; and Matsue, Hiroshi, 4,678,710, Cl. 428-407.000.

Matsui, Sadayoshi; Taneya, Mctotaka; Takiguchi, Haruhisa; and Kaneiwa, Shinji, to Sharp Kabushiki Kaisha. Semiconductor laser. 4,679,200, Cl. 372-45.000.

Matsui, Sumio. Container for storing stack of thin and soft sheet materials. 4,678,099, Cl. 221-48.000.

Matsumoto, Yoshihiro: *See*—
Shinozaki, Masatoshi; Matsumoto, Yoshihiro; Aoyagi, Yoshiki; and Kojima, Kazuhisa, 4,678,707, Cl. 428-323.000.

Matsumoto, Yukiharu: *See*—
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.

Matsumura, Isao: *See*—
Ishikawa, Yasuyuki; and Matsumura, Isao, 4,678,297, Cl. 351-208.000.

Matsumura, Yasushi: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Sengoku, Koji; and Nagatome, Yoshiaki, 4,678,677, Cl. 426-634.000.

Matsuo, Masataka, to Nippon Steel Corporation. Refractory flame-gunning apparatus. 4,678,120, Cl. 239-75.000.

Matsuo, Masayuki: *See*—
Yabu, Yasuo; Abiko, Toshio; and Matsuo, Masayuki, 4,679,051, Cl. 343-700.0MS.

Matsuoka, Kensaku: *See*—
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.

Matsuoka, Yoji: *See*—
Tsujii, Fumio; Matsuoka, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, 4,679,147, Cl. 364-449.000.

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Watanabe, Masaki; Yamamoto, Hitoshi; Matsuoka, Yoshinori; and Tanaka, Kunihiko, 4,678,053, Cl. 180-210.000.

Matsushita Electric Industrial Co., Inc.: *See*—
Kikuchi, Yoichi; and Kobayashi, Kenji, 4,678,725, Cl. 429-53.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ikedo, Masaru; Watari, Masafumi; Hayashi, Yoshiaki; Yamamoto, Osamu; and Tsutsu, Hiroshi, 4,678,275, Cl. 350-96.340.
Kawabuchi, Masami, 4,677,853, Cl. 73-644.000.
Natsumeda, Takeshi; Nawa, Motoyuki; and Sugawara, Norio, 4,677,904, Cl. 98-38.100.
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,679,003, Cl. 331-1.00A.
Tanaka, Eiichi; Furumai, Koro; and Kikutani, Fumitaka, 4,678,428, Cl. 431-76.000.
Tanaka, Toshihide; Saka, Hiroshi; Yoshimura, Yoshikazu; and Shiomi, Yasuhumi, 4,679,249, Cl. 455-328.000.
Tomita, Kazuyuki; and Tanno, Masuo, 4,678,539, Cl. 156-643.000.
Tomita, Masao, 4,679,097, Cl. 358-328.000.
Yoshida, Tomio; and Ohara, Shunji, 4,679,184, Cl. 369-112.000.
Yoshikawa, Yoshitaka; Tsukamoto, Masahide; Nishimura, Yutaka; Ono, Hitoshi; and Sano, Tetsuhiro, 4,679,054, Cl. 346-76.0PH.
Yoshimura, Susumu; Kudoh, Yasuo; Tsuchiya, Soji; Kojima, Toshikuni; and Takahashi, Shohzoh, 4,679,124, Cl. 361-433.000.

Matsushita Electric Works, Ltd.: *See*—
Yabu, Yasuo; Abiko, Toshio; and Matsuo, Masayuki, 4,679,051, Cl. 343-700.0MS.
Yuasa, Hiroyoshi; Yasuda, Akira; and Omura, Koichi, 4,679,077, Cl. 358-108.000.

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Iwai, Tomio; and Matsushita, Yukio, 4,677,826, Cl. 60-602.000.

Matsushita, Yutaka. Free wheel cap. 4,678,239, Cl. 301-37.00N.

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Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,678,496, Cl. 71-76.000.

Mattelin, Antoon; and Paquet, Bert, to Siemens Aktiengesellschaft. Apparatus for the deflection of a light beam. 4,678,289, Cl. 350-486.000.

Matthews, John A.; Striebel, Edmund E.; Sepulveda, Domingo; and Pane, Francis C., Jr., to United Technologies Corporation. Circumferentially area ruled duct. 4,677,828, Cl. 60-751.000.

Matthews, Thomas A.; Fischer, Walter; and Petzwinkler, Lucas. Automobile brake locking system. 4,678,068, Cl. 188-353.000.

Maurer, Fritz; Homeyer, Bernard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Pyridyl-thionophosphoric acid ester useful as pesticides. 4,678,776, Cl. 514-89.000.

Maxim Integrated Products, Inc.: *See*—
Bingham, David; and Allen, Charles M., 4,679,134, Cl. 363-61.000.

May, Roger A., to United States of America, Air Force. Motion sensitive frame integration. 4,679,086, Cl. 358-167.000.

Maycock, Ian C.: *See*—
Ball, Robert J.; and Maycock, Ian C., 4,678,071, Cl. 192-70.270.

Mayfield, Ralph W., to Cincinnati Milacron Inc. Linear actuator. 4,677,869, Cl. 74-424.80R.

Mazda Motor Corporation: *See*—
Handa, Tatuhiro, 4,678,110, Cl. 228-4.100.
Osaki, Sigemi; Yousina, Norio; Morishita, Tsuyoshi; and Kawado, Yasuhumi, 4,678,633, Cl. 419-8.000.
Shimizu, Tsutomu; Tarumoto, Kouji; and Nanba, Satoshi, 4,678,738, Cl. 430-320.000.

Mazurek, Harry, to Atlantic Richfield Company. Molten salt hydrocarbon conversion process using oxygen containing feed. 4,678,862, Cl. 585-500.000.

McAloon, Kevin T.; and Brew, Allan T., to Imperial Chemical Industries PLC. Fibrous composite materials. 4,678,700, Cl. 428-198.000.

McAuley, James A. Method and apparatus for monitoring the density of a liquid. 4,677,851, Cl. 73-434.000.

McCallum, Robert S.; Plasschaert, Paul E.; Landheer, Dolf; and Gandhi, Hemant M. Ionic print cartridge and printer. 4,679,060, Cl. 346-159.000.

McCarthy, Alfred F.: *See*—
Johnson, Philip A.; and McCarthy, Alfred F., 4,679,118, Cl. 361-386.000.

McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., to Dow Chemical Company, The. Miscible polymer blends containing poly(2-alkyl-2-oxazoline). 4,678,833, Cl. 525-66.000.

McCuin, Jon P.: *See*—
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,679,120, Cl. 361-358.000.

McDaniel, Robert S.: *See*—
Malik, Arshad H.; Urfer, Allen D.; McDaniel, Robert S.; and Johnson, Donald L., 4,678,595, Cl. 252-174.170.

McDermott, Robert N.: *See*—
Gelinas, William A.; and McDermott, Robert N., 4,678,100, Cl. 222-52.000.

McElevey, Michael J.: *See*—
Corrie, Brian L.; Benn, Pauline; and McElevey, Michael J., 4,677,737, Cl. 29-571.000.

McElroy, James F., to United Technologies Corporation. Fuel cell battery with improved membrane cooling. 4,678,724, Cl. 429-34.000.

McFarland, Joseph R. Holder for beverage containers and the like. 4,678,154, Cl. 248-311.200.

McGary, Charles W.; and Solomon, Donald D., to Deseret Medical, Inc. Thermoplastic polyurethane anticoagulant alloy coating. 4,678,660, Cl. 424-25.000.

McGeehan, Joseph P.; and Bateman, Andrew, to National Research Development Corporation. Data transmission using a transparent tone-in band system. 4,679,243, Cl. 455-47.000.

McIntosh, Lionel D.: *See*—
Melrose, Richard C.; and McIntosh, Lionel D., 4,678,914, Cl. 250-343.000.

McIntyre, Donald R.; and Miles, James E., to Isotechnologies, Inc. Pelvic restraint for exercise apparatus. 4,678,186, Cl. 272-134.000.

McIntyre, John M.: *See—*
Ham, George E.; Chen, Wuu-Nan; and McIntyre, John M., 4,678,601, Cl. 252-500.000.

McKee, Jere L.; and Thomas, Glenn R., to Westinghouse Electric Corp. Circuit breaker with shock resistant latch trip mechanism. 4,679,018, Cl. 335-167.000.

McKeown, James H. A., to British Telecommunications public limited company. Test equipment for simulating multipath interference. 4,679,248, Cl. 455-226.000.

McKinney, Osborne K.; Allen, James A.; and Flores, David P., to Dow Chemical Company, The. Blends of ethylene/acrylic acid copolymers with linear low density polyethylene. 4,678,836, Cl. 525-221.000.

McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., to Pump Engineer Associates, Inc. Methods and apparatus for recovery of hydrocarbons and other liquids from underground. 4,678,040, Cl. 166-370.000.

McMillan, William G.: *See—*
Gay, Don D.; and McMillan, William G., 4,677,863, Cl. 73-863.120.

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Anderson, J. Dale; McMillen, Kenneth R.; and Goertz, Arnold E., 4,677,814, Cl. 56-15.600.

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Ho, Chih Y., 4,678,784, Cl. 514-219.000.

McRae, Wayne A.: *See—*
Mandle, Robert J.; and McRae, Wayne A., 4,678,553, Cl. 204-182.600.

MD Associates: *See—*
Darras, Robert L., 4,678,668, Cl. 424-94.750.

Meakins, George D.: *See—*
Roe, Anthony M.; Coates, William J.; Slater, Robert A.; Breukelman, Stephen P.; and Meakins, George D., 4,678,786, Cl. 514-247.000.

Meares, Claude F.; DeNardo, Sally J.; Cole, William C.; and Mol, Min K., to 501 Regents of the University of California. Macrocyclic bifunctional chelating agents. 4,678,667, Cl. 424-85.000.

Measurex Corporation: *See—*
Dahlquist, John; Goss, John; and Wennerberg, Gunnar, 4,678,915, Cl. 250-358.100.

Meczkowski, Leonard C.: *See—*
Bronstad, Maurice E.; Hatton, James H., Jr.; and Meczkowski, Leonard C., 4,678,166, Cl. 256-13.100.

Meddaugh, Michael D.: *See—*
Gavin, John D., Jr.; and Meddaugh, Michael D., 4,678,376, Cl. 405-270.000.

Medrad, Inc.: *See—*
Reilly, David M.; and Uber, Arthur E., III, 4,677,980, Cl. 128-655.000.

Medtronic, Inc.: *See—*
Kraska, Robert E.; Wilary, Frank J.; and Lessar, Joseph F., 4,678,868, Cl. 174-152.0GM.

Meier, Beat: *See—*
Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.

Meijer, John, to Akzo NV. Novel desensitized ketone peroxide compositions and their use in the manufacture of foundry cores or moulds. 4,678,817, Cl. 523-144.000.

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Hasson, David; and Karmon, Mordechai, 4,678,685, Cl. 427-235.000.

Melker, Richard J., to University of Florida. Emergency cricothyrotomy system and cricothyrotomy kit. 4,677,978, Cl. 128-207.140.

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Melrose, Richard C.; and McIntosh, Lionel D., to Environmental Tectonics Corporation. Digital IR gas analyzer. 4,678,914, Cl. 250-343.000.

Mencke, Arlene J., to Minnesota Mining and Manufacturing Company. Contact lens cleaning article. 4,678,698, Cl. 428-171.000.

Meniconi, Silvio: *See—*
Fusi, Gaetano; and Meniconi, Silvio, 4,677,935, Cl. 118-108.000.

Mercier, Robert: *See—*
Punzar, Marianne; Marti, Franz; Mercier, Robert; Tobler, Paul; and Buttiker, Rudolf, 4,678,852, Cl. 544-194.000.

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Baldwin, John J.; Halczenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., 4,678,806, Cl. 514-539.000.
Miwa, Gerald T.; and Walsh, John S., 4,678,799, Cl. 514-398.000.
Putter, Irving; and Stout, Daniel M., 4,678,774, Cl. 514-30.000.
Shepard, Kenneth L., 4,678,855, Cl. 564-85.000.

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Neiger, Henri J. C.; Genot, Claude M.; Prud'Hon, Gerard C.; and Schoens, Michel, 4,678,184, Cl. 272-129.000.

Merry, Mark A. Window bar assembly. 4,677,789, Cl. 49-56.000.

Merz, Arthur, to Siemens Aktiengesellschaft. Commissioning system. 4,679,149, Cl. 364-478.000.

Mesa, Clarence M., to Survival Technology, Inc. Automatic injector with improved glass container protector. 4,678,461, Cl. 604-157.000.

Meslif, Alain: *See—*
Henault, Jean-Paul; Drapier, Albert; Grochowski, Guy; and Meslif, Alain, 4,677,939, Cl. 122-17.000.

Messina, Joseph A.: *See—*
Caruso, Robert D.; and Messina, Joseph A., 4,678,891, Cl. 219-121.0LJ.

Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, to Petazon Inc. Planar centrifugal chromatography device. 4,678,570, Cl. 210-198.200.

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Hartmann, Wolfgang; and Gocht, Paul G., 4,678,484, Cl. 55-112.000.

Metatech Corporation: *See—*
Perlin, Alfred R., 4,678,902, Cl. 250-227.000.

Metcalfe, Lincoln D.: *See—*
Brady, Cathereine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, 4,678,580, Cl. 210-490.000.

Methode Electronics, Inc.: *See—*
Romine, Edward L.; and Byczek, Roger W., 4,678,250, Cl. 439-83.000.

Metropolitan Wire Corporation: *See—*
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,678,214, Cl. 292-213.000.

Metz, Hans-Ulrich: *See—*
Buder, Eckart; Metz, Hans-Ulrich; and Ubermeier, Dieter, 4,678,726, Cl. 429-88.000.

Metzger, David B.; Johnson, Glenn S.; and Bramel, Michael D., to General Motors Corporation. Method and apparatus for screen printing solder paste onto a substrate with device premounted thereon. 4,678,531, Cl. 156-250.000.

Mewissen, Jan A. C., to U.S. Philips Corporation. Device for cooling the pinch seal of an electric lamp, and an electric lamp and an irradiation apparatus provided with this cooling device. 4,678,959, Cl. 313-17.000.

Meyers, Vera K.; and Koman, Ahmet. Weight control method. 4,678,779, Cl. 514-176.000.

Miale, Joseph N.: *See—*
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Michler, Denis: *See—*
Catros, Jean-Yves; and Michler, Denis, 4,679,079, Cl. 358-135.000.

Mickewich, Daniel J.: *See—*
Wilhite, Douglas L.; and Mickewich, Daniel J., 4,678,744, Cl. 430-569.000.

Microlife Technics, Inc.: *See—*
Vandenbergh, Peter A.; and Vidaver, Anne K., 4,678,750, Cl. 435-200.000.

Microtel Limited: *See—*
Lipski, Jerzy A.; and Bardsley, Ian R., 4,678,907, Cl. 250-231.0SE.

Mifune, Hiroyuki: *See—*
Yamada, Sumito; Mifune, Hiroyuki; and Urabe, Shigeharu, 4,678,745, Cl. 430-569.000.

Mihal, David G.: *See—*
Brooks, Kenneth L.; Bufkin, Paul R.; Mihal, David G.; and Miller, Jerry G., 4,679,232, Cl. 379-413.000.

Mikada, Kenzo: *See—*
Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, 4,678,571, Cl. 210-202.000.

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Miles, James E.: *See—*
McIntyre, Donald R.; and Miles, James E., 4,678,186, Cl. 272-134.000.

Miles, Scott D.: *See—*
Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., 4,678,752, Cl. 435-291.000.

Millar, Thomas D. Devices for insertion into a body cavity of an animal and/or applicators therefor. 4,678,463, Cl. 604-285.000.

Miller, Carl B.: *See—*
Luke, Robert R.; Barker, James M.; Smith, Michael L.; Grigar, Larry L.; and Miller, Carl B., 4,678,044, Cl. 175-4.520.

Miller, Charles H.; Takeuchi, Kunihiko; and Goodridge, Paul A., to Owens-Corning Fiberglas Corporation. Apparatus for forming fibers. 4,678,490, Cl. 65-14.000.

Miller, Harold L.: *See—*
Vandevier, Joseph E.; Bearden, John L.; Pranger, William F.; and Miller, Harold L., 4,678,399, Cl. 415-199.200.

Miller, James R. Quick connect/disconnect element for lines. 4,678,360, Cl. 403-353.000.

Miller, Jerry G.: *See—*
Brooks, Kenneth L.; Bufkin, Paul R.; Mihal, David G.; and Miller, Jerry G., 4,679,232, Cl. 379-413.000.

Miller, Joseph C.: *See—*
Arldt, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., 4,678,175, Cl. 271-34.000.

Miller, Larry G.: *See—*
Eroskey, Richard E.; and Miller, Larry G., 4,678,530, Cl. 156-245.000.

Mills, Sean R.; and Spector, George. Multiple dice game. 4,678,191, Cl. 273-146.000.

Milton, A. Fenner: *See—*
Burns, William K.; and Milton, A. Fenner, 4,678,267, Cl. 350-96.150.

Mineo, Kinji: *See—*
Mineo, Masanari; and Mineo, Kinji, 4,677,730, Cl. 29-512.000.
Mineo, Masanari; and Mineo, Kinji, to Yamato Iron Works Co., Ltd. Method of attaching press-in flange to drum or like container. 4,677,730, Cl. 29-512.000.
Ministry of International Trade & Industry: *See—*
Sakuragi, Masako; and Ichimura, Kunihiro, 4,678,844, Cl. 525-417.000.
Sekiya, Tadashi; Tsuzuki, Akihiro; and Torii, Yasuyoshi, 4,678,732, Cl. 430-136.000.
Mink, George. Loading and unloading mechanism. 4,678,393, Cl. 414-751.000.
Mink, Wilfried: *See—*
Wessolowski, Bernd; and Mink, Wilfried, 4,677,860, Cl. 73-862.480.
Minnesota Mining and Manufacturing Company: *See—*
Mencke, Arlene J., 4,678,698, Cl. 428-171.000.
Nelson, Norman E., 4,678,080, Cl. 206-387.000.
Tung, Chi F.; and Bacon, Chester A., Jr., 4,678,695, Cl. 428-120.000.
Zarembo, Peter J., 4,677,799, Cl. 52-220.000.
Minney, Stephen C.: *See—*
Gummere, John B.; and Minney, Stephen C., 4,678,049, Cl. 177-229.000.
Minolta Camera Kabushiki Kaisha: *See—*
Hamada, Akiyoshi, 4,679,057, Cl. 346-76.00L.
Mintz, S. Stanley: *See—*
Peterson, Thomas W.; Hole, David B.; and Mintz, S. Stanley, 4,678,952, Cl. 310-83.000.
Misewicz, Leon M.: *See—*
Vrabel, Robert J.; Vajgart, Jeffery L.; Staszel, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.
Mishler, Ralph E.; and Stocco, Peter J., to Synchro-Start Products, Inc. Emergency manual actuation mechanism for a solenoid. 4,679,017, Cl. 335-164.000.
Misra, Chanakya: *See—*
The, Paul J.; and Misra, Chanakya, 4,678,477, Cl. 23-305.00A.
Misumi, Teruo: *See—*
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,678,733, Cl. 430-57.000.
Mita Industrial Co., Ltd.: *See—*
Akiyama, Kazunori; Tsunoda, Arihiro; and Tanaka, Satoshi, 4,678,178, Cl. 271-242.000.
Mitake, Kenjiro, to NEC Corporation. Output circuit having an improved protecting circuit. 4,678,950, Cl. 307-550.000.
Mitani, Ikujirou; Kawanami, Norihide; and Kobayashi, Fumio, to Hirose Electric Co., Ltd. L-type coaxial plug connector. 4,678,261, Cl. 439-582.000.
Mitani, Kazutami: *See—*
Itoh, Hajime; and Mitani, Kazutami, 4,678,813, Cl. 521-61.000.
Mitani, Wataru: *See—*
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, 4,678,731, Cl. 430-65.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Higuchi, Keizo, 4,679,027, Cl. 340-723.000.
Kawamura, Toshimi; and Satow, Takashi, 4,679,020, Cl. 335-216.000.
Kitaoka, Takashi; and Watanabe, Eiki, 4,678,063, Cl. 187-119.000.
Oshikiri, Keiichi; and Nakamura, Tooru, 4,678,949, Cl. 307-527.000.
Sadamori, Yuuichi; and Maeda, Keini, 4,679,045, Cl. 340-825.070.
Shibasaki, Takeshi, 4,679,082, Cl. 358-147.000.
Sugimoto, Shigeyuki; Kato, Masayuki; and Chonan, Katsuhiko, 4,678,980, Cl. 318-759.000.
Takahama, Shinobu, 4,677,741, Cl. 29-588.000.
Tanaka, Minoru; and Yonehata, Yuzuru, 4,678,932, Cl. 307-633.000.
Watakabe, Yaichiro, 4,678,714, Cl. 428-432.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hirano, Takahisa; and Hagimoto, Kiyoshi, 4,678,415, Cl. 418-50.000.
Hirano, Takahisa; Fukami, Shoji; and Maeda, Mitsutosho, 4,678,416, Cl. 418-55.000.
Okamoto, Arifumi, 4,678,388, Cl. 414-92.000.
Suzuki, Tsutomu, 4,678,133, Cl. 242-56.00A.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Hanamura, Eiichi; and Tokura, Yoshinori, 4,678,736, Cl. 430-270.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Itoh, Hajime; and Mitani, Kazutami, 4,678,813, Cl. 521-61.000.
Sasaki, Isao; and Mukai, Nobuhiro, 4,678,819, Cl. 523-171.000.
Mitsui, Osamu; and Fukuoka, Yohei, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing a cycloolefin. 4,678,861, Cl. 585-266.000.
Mitsuka, Ikuo, to Dainippon Screen Mfg. Co., Ltd. Method and system for processing image data in reproducing images. 4,679,155, Cl. 364-525.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Iwano, Hideo; and Shudo, Kazuo, 4,677,755, Cl. 33-503.000.
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, to Nippon Soken, Inc. Semiconductor-type flow rate detecting apparatus. 4,677,850, Cl. 73-204.000.
Miura, Kenji: *See—*
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.
Miwa, Gerald T.; and Walsh, John S., to Merck & Co., Inc. 1,2(1,4)-dimethyl-4(2)-(2-hydroxyethyl)-5-nitro-imidazole antiprotozoal agents with reduced mutagenicity. 4,678,799, Cl. 514-398.000.
Miyake, Hideharu: *See—*
Sugano, Takuo; Okabe, Yoichi; Miyake, Hideharu; and Fukaya, Naoki, 4,678,945, Cl. 307-476.000.
Miyamoto, Keiichi: *See—*
Kobari, Yuji; and Miyamoto, Keiichi, 4,678,056, Cl. 180-247.000.
Miyamoto, Mitsuya; Ooseki, Yasuyuki; and Nabae, Motohiro, to Furukawa Aluminum Co., Ltd. Anodized memory disk substrate and method of manufacturing the same. 4,678,547, Cl. 204-37.100.
Miyamoto, Toshinobu; Hayashi, Hiroo; Sakurai, Hideya; Takabayashi, Hirofumi; and Ohnishi, Youichi, to Sumitomo Special Metal Co. Ltd. Magnetic field generating device for NMR-CT. 4,679,022, Cl. 335-296.000.
Miyano, Seiji: *See—*
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.
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Miyazaki, Hiroshi; Arika, Junji; and Aimoto, Michiyuki, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of faujasite zeolite. 4,678,651, Cl. 423-329.000.
Miyazaki, Makoto: *See—*
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Mizuguchi, Masatsugu: *See—*
Ikariya, Takao; Itagaki, Masanori; Mizuguchi, Masatsugu; Sakai, Itaru; and Tajima, Osamu, 4,678,856, Cl. 560-24.000.
Mizuhara, Howard, to GTE Products Corporation. Ductile brazing alloy containing reactive metals precious metals. 4,678,636, Cl. 420-456.000.
Mizutani, Yuji. *See—*
Takeda, Tamio; Gokyu, Toshio; Mizutani, Yuji; and Nakashima, Jun, 4,678,954, Cl. 310-156.000.
Mobil Oil Corporation: *See—*
Chang, Clarence D.; Penick, Joe E.; and Socha, Richard F., 4,678,645, Cl. 422-190.000.
Chang, Clarence D.; and Miale, Joseph N., 4,678,763, Cl. 502-26.000.
Dahan, Paul C., 4,678,446, Cl. 441-80.000.
Dolan, Michael J.; Hilbert, Timothy L.; and Snyder, John D., 4,678,483, Cl. 55-97.000.
Hartman, Kathy J.; and Shu, Winston R., 4,678,036, Cl. 166-273.000.
Hicks, Michael S.; and Vannauker, David L., 4,678,556, Cl. 208-96.000.
Le, Quang N.; Tsao, Ying-Yen P.; and Wong, Stephen S., 4,678,764, Cl. 502-26.000.
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McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,678,040, Cl. 166-370.000.
Mogensen, Vagn, to Dansk Industri Syndikat A/S. Method and an apparatus for replacing pattern plates in a moulding system. 4,678,021, Cl. 164-40.000.
Mogi, Takao: *See—*
Okada, Takashi; Mogi, Takao; Kobayashi, Hiroyuki; and Ohi, Katsuyuki, 4,679,235, Cl. 380-20.000.
Mohammed, Khalid: *See—*
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Mol, Min K.: *See—*
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Momose, Yutaka: *See—*
Hasegawa, Masahiko; Naito, Yoshihiro; Tsunekawa, Masaru; and Momose, Yutaka, 4,677,824, Cl. 60-521.000.
Mon, George, to United States of America, Army. Fluidic complementary gain changing circuit. 4,678,009, Cl. 137-818.000.
Monahan, Michael B.: *See—*
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Mondeshka, Donka M.: *See—*
Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.
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Monma, Masao: *See—*
Katsurai, Junji; Monma, Masao; and Takaku, Tetsuo, 4,679,053, Cl. 346-1.100.

Monreal, F. Javier. Water gliding scooter board. 4,678,444, Cl. 441-65.000.
Monreal, F. Javier. Water and snow wishbone shaped sled for one or two. 4,678,445, Cl. 441-72.000.
Monsanto Company: *See—*
Chan, Albert S. C., 4,678,662, Cl. 424-57.000.
Flory, Thomas A., 4,677,848, Cl. 73-146.000.
Otstot, Roger S.; and Runkle, Charles J., 4,678,573, Cl. 210-321.100.
Monsigny, Jean, to Aciers et Outillage Peugeot. Buckle in particular for a safety belt. 4,677,716, Cl. 24-641.000.
Montandon, Albert B.: *See—*
Trahan, Wesley J.; and Montandon, Albert B., 4,678,117, Cl. 236-92.00A.
Montanwerke Walter GmbH: *See—*
Speidel, Hans, 4,677,792, Cl. 51-168.000.
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Bertolotti, Franco, 4,678,423, Cl. 425-311.000.
Mooney, Warren M. Apparatus for converting a transfer truck to a flatbed or the like. 4,678,391, Cl. 414-389.000.
Moore Business Forms, Inc.: *See—*
Lukis, Lawrence J., 4,679,241, Cl. 382-13.000.
Moore, Larry V., to Rockwell International Corporation. Electrical connector for circuit boards. 4,678,252, Cl. 439-62.000.
Moorehead, Jack F.; and Campbell, Richard S., Sr., to Fairchild Filter Corporation. Cast filter and automatic self-cleaning backflush control system therefor. 4,678,564, Cl. 210-108.000.
Morelli, Aldo. Excavator with extensible boom. 4,677,772, Cl. 37-103.000.
Mori, Kei. Method of producing a photoradiator device. 4,678,279, Cl. 350-320.000.
Mori, Kenji: *See—*
Saeki, Osamu; Mori, Kenji; Onoda, Mamoru; Watanabe, Ryo; Shinohara, Katsufumi; Ashie, Takehiko; and Imanishi, Nobuyuki, 4,678,508, Cl. 75-26.000.
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Morishita, Tsuyoshi: *See—*
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Morland, Albert H.; and Phoenix, John T., to Coopervision, Inc. Methoding of mounting a partly formed lens blank. 4,677,729, Cl. 29-426.500.
Morokawa, Shigeru, to Citizen Watch Company Limited. Method of driving liquid crystal matrix display. 4,679,043, Cl. 340-784.000.
Morris, Clive A.; and Joby, Michael J., to Lucas Industries public limited company. Control for a limiting device. 4,679,151, Cl. 364-510.000.
Morris, Jerry D.: *See—*
Jensen, Gordon A.; Reames, Stephen P.; Morris, Jerry D.; and Neal, Scott S., 4,679,193, Cl. 370-94.000.
Morris, Robert A.: *See—*
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Moscovici, Poldi, to Superior Manufacturing & Instrument Corporation. Programmable power supply. 4,679,130, Cl. 363-17.000.
Moscovici, Poldi, to Superior Manufacturing & Instrument Corporation. System for alleviating harmonic distortion. 4,679,133, Cl. 363-46.000.
Moser, James N.: *See—*
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Mosher, Oren A., to Package Machinery Company. Combination weighing apparatus for two combined products. 4,678,046, Cl. 177-1.000.
Moskin, Jeffrey M., to Novitas, Inc. Two-terminal line-powered control circuit. 4,678,985, Cl. 323-324.000.
Moss, Brian F.; Brent, Richard J.; and Pilkington, Ian B., to Ciba-Geigy AG. Device for processing exposed photographic film coiled on a spool. 4,678,307, Cl. 354-313.000.
Moss, Brian F.; and Brent, Richard J., to Ciba-Geigy AG. Processing device. 4,678,308, Cl. 354-313.000.
Moss, Brian F.; and Brent, Richard J., to Ciba-Geigy AG. Device for processing a role of exposed film coiled on a spool. 4,678,309, Cl. 354-313.000.
Mossberg & Sons, Inc.: *See—*
Lee, Joseph L., 4,677,781, Cl. 42-70.010.
Most, Manfred: *See—*
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Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, to Kumiai Chemical Industry Co., Ltd. Cyclohexane derivatives having plant-growth regulating activities, and uses of these derivatives. 4,678,496, Cl. 71-76.000.
Motorola Inc.: *See—*
Bauck, Jerald L., 4,678,987, Cl. 324-77.00R.
Ecklund, Lawrence M., 4,679,237, Cl. 381-15.000.
Farace, Louis P., 4,677,913, Cl. 102-215.000.
Peters, Tulley M.; and Bruce, William C., Jr., 4,679,194, Cl. 371-16.000.
Rehbein, Clayton J.; and Battin, Leland B., Jr., 4,678,215, Cl. 292-247.000.
Richardson, Charles P.; Kuhl, Virgil; Gasparaitis, Bernard; Staple, Bruce; and Krieg, Larry M., 4,679,233, Cl. 379-433.000.
Wilson, Timothy J.; and Erickson, Paul M., 4,679,028, Cl. 340-347.0CC.
Moulinex, Societe Anonyme: *See—*
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Mount Isa Mines Limited: *See—*
Hollis, Richard G., 4,678,507, Cl. 75-24.000.
Mowill, Rolf J., to A S Kongsberg Vapenfabrikk. Movable spike, variable entrance geometry pipe diffuser with vibration suppression. 4,678,396, Cl. 415-148.000.
Mrowka, Joseph J.: *See—*
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Magin, Berthold, 4,677,717, Cl. 26-18.500.
Mucheyer, Norbert: *See—*
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Muehleisen, Thomas C., to Alltel Corporation. Computer security guard circuit. 4,679,226, Cl. 379-95.000.
Mukai, Nobuhiro: *See—*
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Mullen, John L.: *See—*
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Muller, Alexander, to General Electric Company. Apparatus for assembling a rotatable assembly. 4,677,744, Cl. 29-729.000.
Muller, Erich: *See—*
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.
Muller, Heinz; Lohmar, Elmar; and Scholz, Harald, to Hoechst Aktiengesellschaft. Process for purifying hydrogen chloride gas. 4,678,482, Cl. 55-71.000.
Muller, Ullrich: *See—*
Hempel, Hans D.; Horn, Jurgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ullrich, 4,678,753, Cl. 435-296.000.
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Muller, Wolfgang: *See—*
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Mundstock, Robert W.: *See—*
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Mundt, Peter; and Neuhold, Arnold, to Geimuplast Peter Mundt GmbH. & Co. KG. Process of manufacturing slide frames. 4,678,525, Cl. 156-73.100.
Murakami, Eiji; Sano, Yasuro; and Hyodo, Tohru, to Janome Sewing Machine Co. Ltd. Method of initially setting a stepping motor in a sewing machine. 4,677,925, Cl. 112-266.100.
Murakami, Yoshikazu; Ito, Seigo; Okamoto, Hiromi; and Tanaka, Hideo, to Sony Corporation. Ferromagnetic resonator. 4,679,015, Cl. 333-219.000.
Muramatsu, Kunihiro, to Nissan Motor Company, Limited. Battery condition monitor and monitoring method. 4,678,998, Cl. 324-427.000.
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Murano, Kazuo: *See—*
Fukuda, Misao; Tsuda, Toshitaka; Murano, Kazuo; and Awata, Yutaka, 4,679,188, Cl. 370-29.000.
Murase, Masaaki, to Kawasaki Jukogyo Kabushiki Kaisha. System for discharging water from crank chamber. 4,678,441, Cl. 440-88.000.
Murayama, Seiichi; Tsujii, Kanji; and Yajima, Yusuke, to Hitachi, Ltd. Method of photochemical surface treatment. 4,678,536, Cl. 156-635.000.
Murphy, David A.: *See—*
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Murray, William P., to Spacesaver Corporation. Portable power source for mobile storage carriage. 4,678,981, Cl. 320-2.000.
Musil, James C.: *See—*
Zahuranec, Emery J.; and Musil, James C., 4,678,380, Cl. 408-211.000.
Muthukrishnan, Ramaurthi: *See—*
Pasteris, Robert J.; and Muthukrishnan, Ramaurthi, 4,678,499, Cl. 71-90.000.
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Focke, Heinz; and Mutschall, Hugo, 4,678,901, Cl. 250-223.00R.
Nabae, Motohiro: *See—*
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Nabeta, Teiichi: *See—*
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Nabisco Brands, Inc.: *See*—
Dartey, Clemence K.; and Biggs, Richard H., 4,678,672, Cl. 426-19.000.
Thulin, Robert R., 4,678,418, Cl. 425-115.000.
Nadolski, Gregory L.: *See*—
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Nagano, Katsumi, to Kabushiki Kaisha Toshiba. Circuit in which output circuit and operational amplifier equipped input circuit are electrically isolated. 4,678,946, Cl. 307-490.000.
Nagano, Syuji: *See*—
Yoshinaka, Toshio; and Nagano, Syuji, 4,678,055, Cl. 180-247.000.
Nagasawa, Kenichi: *See*—
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Nagashima, Nao, to Canon Kabushiki Kaisha. Image processing apparatus. 4,679,096, Cl. 358-287.000.
Nagashima, Yukio: *See*—
Fujita, Masahito; Miyazaki, Makoto; Kizaki, Masami; Nagashima, Yukio; and Shimbori, Yuichi, 4,678,768, Cl. 502-119.000.
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Nagatome, Yoshiaki: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Sengoku, Koji; and Nagatome, Yoshiaki, 4,678,677, Cl. 426-634.000.
Nagel, Gregory L.; Lee, Anthony; and Hill, Warren D., to General Motors Corporation. Method and apparatus for resistance welding. 4,678,887, Cl. 219-117.100.
Nagy, Joseph G.: *See*—
Ciarcia, Ronald D.; DiVincenzo, Gregory T.; Bernier, Richard E.; and Nagy, Joseph G., 4,679,016, Cl. 335-132.000.
Naito, Ryuichi, to Pioneer Electronic Corporation. Method for detecting an error in loading a recording disc. 4,679,181, Cl. 369-44.000.
Naito, Yoshihiro: *See*—
Hasegawa, Masahiko; Naito, Yoshihiro; Tsunekawa, Masaru; and Momose, Yutaka, 4,677,824, Cl. 60-521.000.
Nakada, Takeshi: *See*—
Kobayashi, Mikiya; Nakada, Takeshi; and Arai, Michio, 4,679,056, Cl. 346-76.0PH.
Nakagawa, Kenji: *See*—
Sugishima, Kenji; and Nakagawa, Kenji, 4,678,919, Cl. 250-491.100.
Nakagawa, Masahiro: *See*—
Chiyoma, Hitoshi; Watanabe, Zensaku; and Nakagawa, Masahiro, 4,679,088, Cl. 358-213.180.
Nakagawa, Mitsuhiko; and Nitto, Fumiaki, to Sumitomo Electric Industries, Ltd. Friction material and method of making such material. 4,678,818, Cl. 523-157.000.
Nakajima, Koe: *See*—
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,678,522, Cl. 148-12.00C.
Nakajima, Tadakatsu: *See*—
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.
Nakamoto, Shuhei: *See*—
Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, 4,678,054, Cl. 180-225.000.
Nakamura, Hajime: *See*—
Uchida, Kohachi; Shibuya, Kunihiro; and Nakamura, Hajime, 4,678,314, Cl. 355-5.000.
Nakamura, Junichi, to Olympus Optical Co., Ltd. Solid-state image sensing apparatus having an automatic control loop. 4,678,938, Cl. 307-311.000.
Nakamura, Kazuhito; Sasaki, Hisami; Chigira, Masayoshi; and Yokoi, Kenji, to Lion Corporation. Softener composition. 4,678,590, Cl. 252-8.800.
Nakamura, Mitsutaka: *See*—
Sawatari, Takeo; Nakamura, Mitsutaka; and Sugiura, Toshihiro, 4,677,847, Cl. 73-64.000.
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Photo-electric smoke detector with light shielding electrode. 4,678,921, Cl. 250-574.000.
Nakamura, Tooru: *See*—
Oshikiri, Keiichi; and Nakamura, Tooru, 4,678,949, Cl. 307-527.000.
Nakamura, Tsutomu; and Imai, Kiyoshi, to Shin-Etsu Chemical Co., Ltd. Vibration-damping rubber composition. 4,678,828, Cl. 524-265.000.
Nakanishi, Haruo; Sakaki, Hirokazu; Yamazaki, Toru; and Okishi, Yoshio, to Fuji Photo Film Co., Ltd. Process for producing an aluminum support for a lithographic printing plate. 4,678,551, Cl. 204-129.750.
Nakao, Shinroku; Itoh, Masao; Itoh, Akira; and Takano, Hiroshi, to Combi Co., Ltd. Bicycle ergometer and eddy current brake therefor. 4,678,182, Cl. 272-73.000.
Nakashima, Jun: *See*—
Takeda, Tamio; Gokyu, Toshio; Mizutani, Yuji; and Nakashima, Jun, 4,678,954, Cl. 310-156.000.
Nakayama, Wataru: *See*—
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.
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Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.
Nalco Chemical Company: *See*—
Diep, Daniel V., 4,678,481, Cl. 55-4.000.
Fong, Dodd W.; and Kowalski, David J., 4,678,840, Cl. 525-340.000.
Giddings, David M.; and Williamson, Charles D., 4,678,591, Cl. 252-8.514.
Nalepka, Paul: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
Nalge Company: *See*—
Leoncavallo, Richard A., 4,678,576, Cl. 210-433.200.
Nanba, Satoshi: *See*—
Shimizu, Tsutomu; Tarumoto, Kouji; and Nanba, Satoshi, 4,678,738, Cl. 430-320.000.
NAP Consumer Electronics Corp.: *See*—
Andrea, Johan; Lubchenko, Eugene; and Bradley, Ralph H., 4,679,069, Cl. 358-60.000.
Napier, James J.; and Griffith, Ronald C., to Pennwalt Corporation. 6-phenyl-1,2-3,4,4a,5-6,10b-octahydrobenz(h)isoquinolines useful for treating depression. 4,678,791, Cl. 514-290.000.
Narr, Benthold: *See*—
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.
Naruse, Osamu: *See*—
Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.
Nashef, Aws S.; and Campbell, Todd D., to American Hospital Supply Corporation. Bone-grafting material. 4,678,470, Cl. 623-16.000.
Nason, Clyde K.; and Culp, Gordon W., to Pacesetter Infusion, Ltd. Solenoid drive apparatus for an external infusion pump. 4,678,408, Cl. 417-410.000.
Nasu, Norio: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; Okutu, Toshimitu; Masuyama, Kenichi; and Nasu, Norio, 4,678,697, Cl. 428-141.000.
Nathanson, James A. Method of controlling pests. 4,678,775, Cl. 514-47.000.
National Communications Research Center, Inc.: *See*—
Jones, Ronald R., 4,679,239, Cl. 381-16.000.
National Molding Corporation: *See*—
Anscher, Joseph, 4,677,711, Cl. 24-200.000.
National Research Development Corporation: *See*—
McGeehan, Joseph P.; and Bateman, Andrew, 4,679,243, Cl. 455-47.000.
National Semiconductor Corporation: *See*—
Layher, Francis W., 4,678,358, Cl. 403-28.000.
National Starch and Chemical Corporation: *See*—
Lauria, Vincent A., 4,678,824, Cl. 524-48.000.
Natsumeda, Takeshi; Nawa, Motoyuki; and Sugawara, Norio, to Matsushita Electric Industrial Co., Ltd. Fluid flow control assembly. 4,677,904, Cl. 98-38.100.
Nauman, John D.: *See*—
Johns, Robert H.; and Nauman, John D., 4,678,719, Cl. 428-593.000.
Nawa, Motoyuki: *See*—
Natsumeda, Takeshi; Nawa, Motoyuki; and Sugawara, Norio, 4,677,904, Cl. 98-38.100.
Nawata, Kazumasa; and Kanai, Yasunori, to Fujitsu Limited. Inner bias circuit for generating ECL bias voltages from a single common bias voltage reference. 4,678,935, Cl. 307-297.000.
NCR Corporation: *See*—
Blanford, Denis M., 4,679,154, Cl. 364-525.000.
Neal, Scott S.: *See*—
Jensen, Gordon A.; Reames, Stephen P.; Morris, Jerry D.; and Neal, Scott S., 4,679,193, Cl. 370-94.000.
Nebelung, Hermann H.; and Knoth, Werner-Dieter, to Emhart Industries, Inc. Blowhead arrangement for a glassware container manufacturing machine. 4,678,494, Cl. 65-261.000.
NEC Corporation: *See*—
Aoyagi, Masaru; and Saitoh, Makoto, 4,679,177, Cl. 367-132.000.
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.
Mitake, Kenjiro, 4,678,950, Cl. 307-550.000.
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.
Takahara, Atsushi; Ishikawa, Tomoyoshi; Tanaka, Hiroyuki; and Okui, Tamio, 4,679,004, Cl. 331-14.000.
Tsugane, Syuzo; and Nishiwaki, Mitsuo, 4,679,081, Cl. 358-138.000.
Yamanaka, Hiroshi, 4,678,889, Cl. 219-121.0LJ.
Negev Phosphates Ltd.: *See*—
Alexander, Iosef; and Bar-on, Menachem, 4,678,649, Cl. 423-308.000.
Neiger, Henri J. C.; Genot, Claude M.; Prud'Hon, Gerard C.; and Schoens, Michel, to Merobel - Societe Anonyme Fracaise. Constant force exercise device. 4,678,184, Cl. 272-129.000.
Neil, Robert B.; and Adleman, George L., to Hewlett-Packard Company. Smoothing discontinuities in the display of serial parallel line segments. 4,679,039, Cl. 340-728.000.

Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Rigsbee, Everett O., III; and Teener, Michael D., to CXC Corporation. Variable bandwidth switching system. 4,679,191, Cl. 370-84.000.

Nelson, Marvin D., to Honeywell Inc. Over-temperature control for a thermostat. 4,679,023, Cl. 337-140.000.

Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Videocassette sleeve and cover. 4,678,080, Cl. 206-387.000.

Nelson, Richard D.; and Evans, James D., to Performance Feeders, Inc. Overload release clutch. 4,678,452, Cl. 464-38.000.

Nemit, Paul, Jr.: *See*—
Piliis, Joseph W.; Murphy, David A.; Spellar, Peter C.; and Nemit, Paul, Jr., 4,678,406, Cl. 417-310.000.

Nemoto, Tsuneo, to Sony Corporation. Magnetic tape cassette with reel brake mechanism. 4,678,138, Cl. 242-198.000.

Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., to Vsesojuzny Institut Po Proektirovaniju Organizatsii Energeticheskogo Stroitelstva. Transfer assembly of belt conveyor. 4,678,076, Cl. 198-525.000.

Nerrinck, Bernard: *See*—
Benoit, Louis; Mabboux, Michel; Nerrinck, Bernard; and De Marchi, Jean-Louis, 4,677,768, Cl. 36-117.000.

Nervig, Charles H.; and Dimmick, Vance E., to American Greeting Corporation. Page type display fixture with self return feature. 4,678,086, Cl. 211-47.000.

Neu, Horst W., to Northrop Corporation. Honeycomb cutter and chip breaker/chaf remover. 4,677,886, Cl. 82-53.000.

Neubauer, Heinz, to Siemens Aktiengesellschaft. Endocardial electrode controllable to form selected contours. 4,677,990, Cl. 128-786.000.

Neuhold, Arnold: *See*—
Mundt, Peter; and Neuhold, Arnold, 4,678,525, Cl. 156-73.100.

New Holland Inc.: *See*—
Dallinger, James F., 4,678,129, Cl. 241-101.700.
Martenas, Wayne B., 4,678,130, Cl. 241-222.000.

New Mexico State University Foundation: *See*—
Zartman, David L., 4,677,967, Cl. 128-1.00R.

New Super Laundry Machinery Co. Inc.: *See*—
Kamberg, Eduard, 4,677,773, Cl. 38-44.000.

New York University: *See*—
Llinas, Rodolfo R.; Sugimori, Mutsuyuki; and Crank, Ronald K., 4,677,982, Cl. 128-664.000.

Newell, Robert E.; Rand, Paul K.; and Osterweil, Carole A., to Glaxo Group Limited. Dispensing device. 4,678,106, Cl. 222-162.000.

Newman, Lola; and Zelasko, Joseph. Detachable foam-borne mounting method. 4,678,150, Cl. 248-205.300.

Newman, Michael A.: *See*—
Edwards, David V.; and Newman, Michael A., 4,678,443, Cl. 441-38.000.

Ney, Reuben E.: *See*—
Farrar, John C.; Ney, Reuben E.; and Schroeder, James L., III, 4,679,013, Cl. 333-182.000.

Nicholson, Horace: *See*—
Maker, Lewis W.; and Nicholson, Horace, 4,678,084, Cl. 206-597.000.

Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, to Dr. Karl Thomae GmbH. Quaternary 3,4-dihydro-isoquinolinium salts. 4,678,792, Cl. 514-307.000.

Nickola, Richard A.; Sok, Brian A.; and Agarwal, Shashi B., to Inland Steel Company. Powder metal and/or refractory coated ferrous metals. 4,678,717, Cl. 428-553.000.

Nicolet Instrument Corporation: *See*—
Anderson, Charles R., 4,678,333, Cl. 356-346.000.
Boese, Roland, 4,678,340, Cl. 366-111.000.

Nicoloso, Dante, to Alsthom. Operating mechanism for a circuit-breaker, and a circuit-breaker fitted with the mechanism. 4,678,877, Cl. 200-148.00F.

Nielsen, Max E.; Labrum, Joseph H.; and Grant, Patrick S., to Sperry Corporation. Exceedance counting integrating photo-diode array. 4,679,215, Cl. 377-95.000.

Nigrelli, Biagio, Sr. Carton opening apparatus. 4,678,456, Cl. 493-309.000.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,678,795, Cl. 514-341.000.

Niiranen, Tapani; Savolainen, Erkki; and Kohonen, Raimo, to Enzo-Gutzeit OY. Disc filter. 4,678,574, Cl. 210-327.000.

Nikaido, Akira, to Citizen Watch Co., Ltd. Linear motor. 4,678,951, Cl. 310-13.000.

Nikitin, Vladimir V.: *See*—
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.

Nippon Air Brake Co., Ltd.: *See*—
Tamamori, Hideo; and Ikeda, Mitsuhiro, 4,678,241, Cl. 303-33.000.

Nippon Coinco Kabushiki Kaisha: *See*—
Kobayashi, Osamu; Akagawa, Masaki; and Hayashi, Hiroshi, 4,678,072, Cl. 194-206.000.

Nippon Dacro Shamrock Co., Ltd.: *See*—
Ayukawa, Nobuhiro; and Konishi, Yasuhiko, 4,678,518, Cl. 148-6.200.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kamoshita, Yasuhiko; Tamaru, Takuya; Ogusu, Mikio; and Urata, Kazuo, 4,679,182, Cl. 369-77.200.

Nippon Kokan Kabushiki Kaisha: *See*—
Ikariya, Takao; Itagaki, Masanori; Mizuguchi, Masatsugu; Sakai, Itaru; and Tajima, Osamu, 4,678,856, Cl. 560-24.000.

Nippon Sheet Glass Co., Ltd.: *See*—
Tamenori, Hiroyuki; Hattori, Akihiko; and Yoshiyagawa, Mitsugi, 4,678,652, Cl. 423-339.000.
Yoshizawa, Hideo, 4,678,495, Cl. 65-287.000.

Nippon Soken, Inc.: *See*—
Fukami, Akira; Oshiro, Takao; and Sasaya, Hideaki, 4,678,118, Cl. 237-12.30B.
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,677,850, Cl. 73-204.000.
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, 4,678,921, Cl. 250-574.000.

Nippon Steel Corporation: *See*—
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,678,522, Cl. 148-12.00C.
Matsuo, Masataka, 4,678,120, Cl. 239-75.000.

Nippon Telegraph and Telephone Corporation: *See*—
Sakakibara, Kazuhiko; and Kuwata, Yutaka, 4,679,129, Cl. 363-17.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.

Nippondenso Co., Ltd.: *See*—
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, 4,678,921, Cl. 250-574.000.
Takao, Mitsunori, 4,677,955, Cl. 123-489.000.

Nishida, Hiroshi; and Inoue, Takemi, to Kawasaki Jukogyo Kabushiki Kaisha. Method of fitting grip over handlebar and grip used in carrying the method into practice. 4,677,872, Cl. 74-551.900.

Nishida, Hiroshi; and Yazaki, Mitsuhiro, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus responsive to shortage of coolant in an engine of a boat. 4,678,442, Cl. 440-89.000.

Nishiguchi, Fumio: *See*—
Komatsu, Hiroshi; and Nishiguchi, Fumio, 4,678,397, Cl. 415-151.000.

Nishimatsu, Masaharu: *See*—
Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, 4,678,708, Cl. 428-336.000.

Nishimura, Sanji: *See*—
Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, 4,678,646, Cl. 422-245.000.

Nishimura, Seiichi; and Takayasu, Hidekazu, to Sanshin Kogyo Kabushiki Kaisha. Fuel supplying device for internal combustion engine. 4,677,944, Cl. 123-73.00B.

Nishimura, Yuji; Fujiwara, Akinori; and Kanada, Shigeyasu, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Controller for automatically effecting disengagement of buckle device. 4,678,928, Cl. 307-10.0SB.

Nishimura, Yutaka: *See*—
Yoshikawa, Yoshitaka; Tsukamoto, Masahide; Nishimura, Yutaka; Ono, Hitoshi; and Sano, Tetsuhiro, 4,679,054, Cl. 346-76.0PH.

Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, to Japan Aviation Electronics Industry Limited; NEC Corporation; and Hirose Denki Kabushiki Kaisha. Connector. 4,678,256, Cl. 439-347.000.

Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Illuminating optical system for endoscopes. 4,678,900, Cl. 250-205.000.

Nishiwaki, Mitsuo: *See*—
Tsugane, Syuzo; and Nishiwaki, Mitsuo, 4,679,081, Cl. 358-138.000.

Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,677,942, Cl. 123-41.210.
Kobari, Yuji; and Miyamoto, Keiichi, 4,678,056, Cl. 180-247.000.
Komatsu, Hiroshi; and Nishiguchi, Fumio, 4,678,397, Cl. 415-151.000.
Kubo, Jun, 4,679,146, Cl. 364-426.000.
Muramatsu, Kunihiro, 4,678,998, Cl. 324-427.000.
Yamamori, Takahiro; Takagi, Yasuo; and Furukawa, Junichi, 4,677,878, Cl. 74-861.000.

Nissinen, Martti: *See*—
Lehtikoski, Olavi; and Nissinen, Martti, 4,678,325, Cl. 356-73.000.

Nitchman, Harold L.; and Cunningham, William B., Jr. Dispensing container closure. 4,678,101, Cl. 222-82.000.

Nitto Boseki Co., Ltd: *See*—
Ueda, Toshio; Kageno, Kenji; and Harada, Susumu, 4,678,474, Cl. 8-543.000.

Nitto, Fumiski: *See*—
Nakagawa, Mitsuhiko; and Nitto, Fumiaki, 4,678,818, Cl. 523-157.000.

Nixdorf Computer AG: *See*—
Laue, Hans-Bodo, 4,678,939, Cl. 307-445.000.

Noble, Philip C.; Tullos, Hugh S.; and Davidson, John P. Method and apparatus for preventing rotational failure of orthopedic endoprostheses. 4,678,471, Cl. 623-16.000.

Noda, Shoji: *See*—
Kamigaito, Osami; Doi, Haruo; Noda, Shoji; Hioki, Tatsumi; Itoh, Akio; and Kakeno, Mitsutaka, 4,678,678, Cl. 427-38.000.

Nodes, Rudolf; and Hoffmann, Jurgen, to Sartorius GmbH. Flat filter element for the filtration of fluids. 4,678,578, Cl. 210-445.000.

Nogi, Tatsuo; Iwami, Tomonori; and Tanaka, Kazumi, to Toray Industries, Inc. Polymethyl methacrylate hollow fiber type ultrafiltration membrane and process for preparation of the same. 4,678,581, Cl. 210-500.230.

Noguchi, Ichiro: *See*—
Sumikawa, Seiji; and Noguchi, Ichiro, 4,677,830, Cl. 62-126.000.

Noiles, Douglas G., to Joint Medical Products Corporation. Ball and socket bearing for artificial joint. 4,678,472, Cl. 623-1.800.

Noma Inc.: *See*—
Maddock, William H.; and Bobrovniczky, Bert, 4,678,153, Cl. 248-229.000.
Nomura, Kazuhiro, to Toyota Jidosha Kabushiki Kaisha. Construction of mudguard of movable fender portion in motor vehicle. 4,678,198, Cl. 280-153.00A.
Non Mar, Inc.: *See*—
Kellogg, Joseph A.; and Prather, James E., 4,677,840, Cl. 72-465.000.
Noonan, Joseph F.: *See*—
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,679,120, Cl. 361-358.000.
Norell, Maria G.; and Wanngård, Johan C., to KemaNord AB. Process for preparing chlorine dioxide. 4,678,653, Cl. 423-478.000.
Norell, Maria G.: *See*—
Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Axegård, Peter A., 4,678,654, Cl. 423-478.000.
North American Philips Corporation: *See*—
Shone, Michael F.; and Loiacono, Gabriel M., 4,679,198, Cl. 372-41.000.
Sorrow, Billy B., 4,678,890, Cl. 219-121.00L.
North China Research Institute of Electro-Optics: *See*—
Yu-Zhong, Liu, 4,678,546, Cl. 204-32.100.
North States Industries, Inc.: *See*—
Larson, Donald A.; and Runyon, Peter M., 4,677,791, Cl. 49-463.000.
Northern Engineering, Inc.: *See*—
Kittleson, Karl A., 4,679,024, Cl. 338-160.000.
Northern Telecom Limited: *See*—
Charlebois, Leonard J., 4,678,866, Cl. 174-88.00R.
Finn, Roger C.; and MacKenzie, Morley S., 4,678,272, Cl. 350-96.210.
Hogeboom, John G.; and Thomas, Terence N., 4,679,209, Cl. 375-17.000.
Northman, Bradley L.; Slavin, Michael; and West, Donald J., to Lectron Products, Inc. Electrically operated automatic transmission controller assembly. 4,678,006, Cl. 137-596.170.
Northrop Corporation: *See*—
Neu, Horst W., 4,677,886, Cl. 82-53.000.
Norton Company: *See*—
Agarwal, Anil K.; and Hay, Robert A., 4,678,762, Cl. 501-127.000.
Stole, Kjell A.; Lovsland, Arnstien; and Havig, Egil, 4,678,560, Cl. 209-23.000.
Norton, William W., to Culligan International Company. Purified water storage system with accumulator tank and diaphragm responsive valves. 4,678,565, Cl. 210-110.000.
Novitas, Inc.: *See*—
Moskin, Jeffrey M., 4,678,985, Cl. 323-324.000.
Nowotny, Georg: *See*—
Visek, Tomas; Czaby, Gottfried; and Nowotny, Georg, 4,677,952, Cl. 123-372.000.
Nozawa, Shigenori; Ohaya, Katsumi; and Kawazoe, Toshiji, to Pfizer Inc. Topical anti-inflammatory compositions. 4,678,666, Cl. 424-81.000.
Nuclear Energy Systems, Inc.: *See*—
Dodd, Francis J., 4,677,916, Cl. 104-118.000.
Nuetrogena Corporation: *See*—
Scott, Richard A.; Wortzman, Mitchell S.; and Jungermann, Eric, 4,678,663, Cl. 424-62.000.
Nyiredy-Mikita, Klara: *See*—
Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.
Nyiredy, Szabolcs: *See*—
Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.
Nyman, Georg N.; Pauliny, Ferdinand; and Schindl, Klaus P., to C. Reichert Optische Werke AG. Optical arrangement for microscopes. 4,678,291, Cl. 350-510.000.
Oba, Toshio: *See*—
Itoh, Kunio; Kozakai, Shohei; Hida, Yoshinori; Okinoshima, Hiroshige; Okada, Fumio; Oba, Toshio; Shimizu, Hisashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,678,688, Cl. 427-387.000.
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Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,678,733, Cl. 430-57.000.
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Yoshida, Tomio; and Ohara, Shunji, 4,679,184, Cl. 369-112.000.
Ohashi, Ken: *See*—
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Ito, Toshimitsu; and Okamoto, Akio, 4,677,954, Cl. 123-478.000.
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Inamura, Kazuhiko, 4,677,759, Cl. 34-58.000.

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Izukawa, Kazuhiro; Tsukimoto, Takayuki; and Okumura, Ichiro, 4,678,956, Cl. 310-323.000.

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Nakamura, Junichi, 4,678,938, Cl. 307-311.000.
Nishioka, Kimihiko, 4,678,900, Cl. 250-205.000.

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Koizumi, Haruyuki; and Omae, Koichi, 4,678,880, Cl. 200-340.000.

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Hirano, Masao; Takaoka, Motoaki; and Shimura, Mikihiko, 4,679,157, Cl. 364-557.000.
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Tateisi, Kazuma; and Shinohara, Yoshitsugu, 4,678,895, Cl. 235-379.000.

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Kikuchi, Masafumi; Onodera, Toshio; Toyama, Sumio; and Sakamoto, Hiroshi, 4,679,091, Cl. 358-242.000.

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Weisert, Edward D., 4,678,115, Cl. 228-183.000.

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Ortloff, John E., to Exxon Production Research Co. Apparatus for quick-release of a storage vessel from a riser. 4,677,930, Cl. 114-230.000.

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Fukami, Akira; Oshiro, Takao; and Sasaya, Hideaki, 4,678,118, Cl. 237-12.30B.

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Pontius, Klaus; Settinger, Manfred; and Oster, Lothar, 4,678,343, Cl. 366-349.000.

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Otto, Erich: *See*—
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Outlaw, Benjamin T.; and Oude Alink, Bernardus A., 4,678,638, Cl. 422-13.000.

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Wooters, Eldon W., 4,678,058, Cl. 180-273.000.

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Hoffman, David; Verduin, Lee C.; and Ouwinga, Ross, 4,677,777, Cl. 40-460.000.

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Yaniv, Zvi; Chapelle, Walter E.; Lien, Shui-Chih A.; and Yang, Mohshi, 4,678,282, Cl. 350-334.000.

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Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., 4,678,752, Cl. 435-291.000.

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Miller, Charles H.; Takeuchi, Kunihiko; and Goodridge, Paul A., 4,678,490, Cl. 65-14.000.

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Fillmore, William E., 4,678,082, Cl. 206-459.000.

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Harry, Alan, 4,678,139, Cl. 242-199.000.

Pace, Nevlin C. Concentric light source to fiber coupling system. 4,678,269, Cl. 350-96.180.

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Mosher, Oren A., 4,678,046, Cl. 177-1.000.

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Gressett, Charles A., Jr.; Page, John F.; Smith, Daniel J.; and Carruthers, John, 4,677,891, Cl. 84-313.000.

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Vikterlof, Karl-Johan; and Palsgard, Gote, 4,679,076, Cl. 358-107.000.

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Matthews, John A.; Striebel, Edmund E.; Sepulveda, Domingo; and Pane, Francis C., Jr., 4,677,828, Cl. 60-751.000.

Panova, Yordanka T.: *See—*
Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rosaitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.

Pape, Werner, to Robert Bosch GmbH. Fuel injection pump. 4,677,951, Cl. 123-357.000.

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Paquet, Bert: *See—*
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Hatzakis, Michael; Liutkus, John J.; Paraszczsak, Jurij R.; and Shaw, Jane M., 4,678,850, Cl. 526-293.000.

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De Marchi, Jean-Louis; Mabboux, Michel; Paris, Jean; and Kopp, Norbert, 4,677,770, Cl. 36-120.000.

Park, David W. Treatment of formaldehyde-containing wood panel products. 4,678,686, Cl. 427-254.000.

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Viola, Frank J.; and Hubner, Henry H., Jr., 4,678,217, Cl. 294-16.000.

Parker, Leslie K.: *See—*
Bowyer, William H.; Crocker, Robert L.; Hansford, Christopher M.; Parker, Leslie K.; and Gray, Nigel, 4,678,194, Cl. 273-373.000.

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Parron, Ivan; and Rosenthal, Michael R. Support assembly for a shelf or like structure. 4,677,794, Cl. 52-36.000.

Parsapour, Hossein B.: *See—*
Arldt, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., 4,678,175, Cl. 271-34.000.

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Patton, Keith H.: *See—*
Sundberg, Kenneth R.; and Patton, Keith H., 4,678,911, Cl. 250-253.000.

Paul Flum Ideas, Inc.: *See—*
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Shirey, Phillip G.; Rowe, David W.; and Waynick, William R., 4,678,027, Cl. 165-70.000.

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Nyman, Georg N.; Pauliny, Ferdinand; and Schindl, Klaus P., 4,678,291, Cl. 350-510.000.

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McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,678,833, Cl. 525-66.000.

Pawlowski, Thomas D.: *See—*
Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., 4,678,882, Cl. 219-10.55E.

Pearson, Michael J.: *See—*
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Graham, Walker O.; and Pearson, William T., 4,678,012, Cl. 139-1.00C.

Pechuzal, Georges A.: *See—*
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Peck, Stephen R.: *See—*
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Peels, Antonius H. P. M., to U.S. Philips Corporation. Color display tube. 4,678,964, Cl. 313-414.000.

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Peitz, Theo: *See—*
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Penick, Joe E.: *See—*
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Penn Plax Plastics, Inc.: *See—*
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Goldman, Terry, 4,678,568, Cl. 210-169.000.

Pennington, Keith S.; Afzali-Ardakani, Ali; and Sachdev, Krishna G., to International Business Machines Corporation. Resistive printing ribbon having improved properties. 4,678,701, Cl. 428-213.000.

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Napier, James J.; and Griffith, Ronald C., 4,678,791, Cl. 514-290.000.
Sandler, Stanley R., 4,678,842, Cl. 525-359.100.
Toukan, Sameeh S., 4,678,592, Cl. 252-25.000.

Perdue, Terry A., to Heath Company. Navigation system and method for a mobile robot. 4,679,152, Cl. 364-513.000.

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Nelson, Richard D.; and Evans, James D., 4,678,452, Cl. 464-38.000.

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Dong, Michael W.; Yarbro, Stanley K.; and Vandermark, Frank, 4,678,639, Cl. 422-81.000.
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,679,162, Cl. 364-571.000.
Helms, Charles C.; Conlon, Ralph D.; and Delany, Edward B., 4,678,917, Cl. 250-373.000.

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Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Mallory, Chester L., 4,679,137, Cl. 364-188.000.

Perma-Jack Company: *See—*
Langenbach, George F., Jr., 4,678,373, Cl. 405-230.000.

Perry, David A.; and Stratton, Richard D., to Perkins Industries, Inc. Treatment of wood veneers in plywood manufacturing. 4,678,532, Cl. 156-314.000.

Perry, Matthew J., to Baxter Travenol Laboratories, Inc. Multicuvette rotor assembly. 4,678,331, Cl. 356-246.000.

Perry, Steven B.: *See—*
Lynch, Daniel; and Perry, Steven B., 4,679,224, Cl. 379-26.000.

Personal Products Company: *See—*
Holtman, Dennis C., 4,678,464, Cl. 604-385.00R.
Spano, John D., 4,677,810, Cl. 53-428.000.
Ulman, John, 4,678,527, Cl. 156-213.000.

Petazon Inc.: *See—*
Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.

Peters, Tulley M.; and Bruce, William C., Jr., to Motorola, Inc. Load double test instruction. 4,679,194, Cl. 371-16.000.

Petersen, Wallace C., to Du Pont de Nemours, E. I., and Company. Triazine-substituted herbicidal azobenzenesulfonamides. 4,678,497, Cl. 71-86.000.

Peterson, Richard H.: *See—*
Kramer, Justin; and Peterson, Richard H., 4,677,892, Cl. 84-405.000.

Peterson, Thomas W.; Hole, David B.; and Mintz, S. Stanley, to Intelledex Incorporated. Sealed joint for a robot and the like. 4,678,952, Cl. 310-83.000.

Peth, Horst: *See—*
Hess, Heinz; and Peth, Horst, 4,679,064, Cl. 358-24.000.

Petit, Andre , to Alcatel. Metal junction box for plug-in multicontact connector. 4,678,259, Cl. 439-610.000.

Petro Products, Inc.: *See—*
Lancaster, Robert L.; and Shaw, Raymond E., 4,678,702, Cl. 428-252.000.

Petrolite Corporation: *See—*
Outlaw, Benjamin T.; and Oude Alink, Bernardus A., 4,678,638, Cl. 422-13.000.

Petzoldt, Hans U.: *See—*
Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,678,543, Cl. 202-154.000.

Petzwinkler, Lucas: *See—*
Matthews, Thomas A.; Fischer, Walter; and Petzwinkler, Lucas, 4,678,068, Cl. 188-353.000.

Pfaff Industrie Maschinen GmbH: *See—*
Dusch, Albert; and Willenbacher, Erich, 4,677,926, Cl. 112-274.000.

Pfaff Industriemaschinen GmbH: *See—*
Diener, Horst; Albrecht, Ernst; and Willenbacher, Erich, 4,677,924, Cl. 112-258.000.

Pfaff, Paul H.; Spagna, Richard N.; Clucas, Robert A.; Coulson, Paul; and Eskandry, Ezra D., to Sensormatic Electronics Corporation. Tri-signal electromagnetic article surveillance system. 4,679,035, Cl. 340-572.000.

Pfiffner, Albert: *See—*
Dorn, Franz; Pfiffner, Albert; and Zehnder, Beat, 4,678,790, Cl. 514-277.000.

Pfizer Inc.: *See—*
Kadin, Saul B., 4,678,802, Cl. 514-418.000.
Larson, Eric R.; and Siegel, Todd W., 4,678,749, Cl. 435-183.000.
Nozawa, Shigenori; Ohaya, Katsumi; and Kawazoe, Toshiji, 4,678,666, Cl. 424-81.000.

Richardson, Kenneth; and Whittle, Peter J., 4,678,789, Cl. 514-262.000.

Phelps, Russell: *See—*
Purvis, Gene; Phelps, Russell; Dupler, Tim; Landoll, Patrick; and Landoll, Leonard, 4,678,010, Cl. 138-31.000.

Philby, Jonathan D., to AE PLC. Pistons for internal combustion engines. 4,677,900, Cl. 92-212.000.

Philip Morris Incorporated: *See—*
Kallianos, Andrew G.; Sprinkel, Francis M., Jr.; and Decker, Paula, 4,677,995, Cl. 131-335.000.

Phillips, Edward H. Steel shell modules for prisoner detention facilities. 4,677,798, Cl. 52-106.000.

Phillips, Gerald: *See—*
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Goldman, Terry, 4,678,568, Cl. 210-169.000.

Phillips Michael. Injectable fomulations of disulfiram for the treatment of alcoholism. 4,678,809, Cl. 514-599.000.

Phillips Petroleum: *See—*
Sundberg, Kenneth R.; and Patton, Keith H., 4,678,911, Cl. 250-253.000.

Phillips, Randall, to Phillips, Randall; and Phillips, Sumiko, a part interest. Transparency lamination process. 4,678,689, Cl. 428-13.000.

Phillips, Stephen R., to Luxtron Corporation. Optical sensors for detecting physical parameters utilizing vibrating piezoelectric elements. 4,678,905, Cl. 250-227.000.

Phillips, Sumiko: *See—*
Phillips, Randall, 4,678,689, Cl. 428-13.000.

Phoenix, John T.: *See—*
Morland, Albert H.; and Phoenix, John T., 4,677,729, Cl. 29-426.500.

Photo-Me International PCL: *See—*
Flitton, James F., 4,678,305, Cl. 354-203.000.

Piche, Luc, to Canadian Patents & Development Limited. Ultrasonic density measurement. 4,677,842, Cl. 73-32.00A.

Picker International, Inc.: *See—*
Haacke, E. Mark; and Bearden, Francis H., 4,678,996, Cl. 324-309.000.

Pieperbeck, Norbert: *See—*
Losch, Hans-Wilhelm; Kleinrahm, Rainer; Pieperbeck, Norbert; and Wagner, Wolfgang, 4,678,048, Cl. 177-212.000.

Pigmans, Henricus J. M.: *See—*
Huisman, Hendrikus F.; and Pigmans, Henricus J. M., 4,678,705, Cl. 428-315.900.

Pike, Roscoe A., to United Technologies Corporation. Amorphous hydrated metal oxide primer for composite fibers. 4,678,820, Cl. 523-200.000.

Pilkington, Ian B.: *See—*
Moss, Brian F.; Brent, Richard J.; and Pilkington, Ian B., 4,678,307, Cl. 354-313.000.

Pillis, Joseph W.; Murphy, David A.; Spellar, Peter C.; and Nemit, Paul, Jr., to Frick Company. Variable volume ratio screw compressor with step control. 4,678,406, Cl. 417-310.000.

Pimbley, Joseph M.: *See—*
Lillquist, Robert D.; Pimbley, Joseph M.; and Vogelsong, Thomas L., 4,679,068, Cl. 358-44.000.

Pink, John J., to Amana Refrigeration, Inc. Refrigerator shelf for dispensing cans or thawing food. 4,678,247, Cl. 312-116.000.

Pinyan, James A.; and Buckley, B. Shawn, to Cochlea Corporation. Method of an apparatus for inspecting and/or positioning objects with wave energy using wave guides. 4,677,852, Cl. 73-628.600.

Pioneer Electronic Corporation: *See—*
Naito, Ryuichi, 4,679,181, Cl. 369-44.000.
Yokota, Hiroshi, 4,679,100, Cl. 360-15.000.

Piper FM Limited: *See—*
Gayler, Robert J., 4,677,958, Cl. 123-585.000.

Pisanty, Sara: *See—*
Segal, Ruth; Pisanty, Sara; and Azaz, Emma, 4,678,772, Cl. 514-25.000.

Pittman, Clarence B.: *See—*
Cadwell, George H., Jr.; Pittman, Clarence B.; and Bowers, Cecil W., 4,678,487, Cl. 55-385.00A.

Pitzenberger, Steven M.: *See—*
Baldwin, John J.; Halczenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., 4,678,806, Cl. 514-539.000.

Plasma Energy Corporation: *See—*
Camacho, Salvador L.; and Camacho, David P., 4,678,888, Cl. 219-121.0PW.

Plasschaert, Paul E.: *See—*
McCallum, Robert S.; Plasschaert, Paul E.; Landheer, Dolf; and Gandhi, Hemant M., 4,679,060, Cl. 346-159.000.

Plyler, Robert G., to General Motors Corporation. Universal grommet retainer. 4,678,146, Cl. 248-56.000.

PMC Specialties Group, Inc.: *See—*
Flores, Robert J., 4,678,613, Cl. 260-391.000.

Podhajecki, Stephen T.: *See—*
Alling, Richard L.; Shepard, Richard W.; Landrum, Clyde L.; Tofield, Robert H.; and Podhajecki, Stephen T., 4,677,720, Cl. 29-148.40C.

Policastro, Peter P.: *See—*
Hallgren, John E.; Policastro, Peter P.; Chao, Herbert S.; and Johnson, Bruce C., 4,678,839, Cl. 525-390.000.

Pomerene, James H.; Puzak, Thomas R.; Rechtschaffen, Rudolph N.; Rosenfeld, Philip L.; and Sparacio, Frank J., to International Business Machines Corporation. Pageable branch history table. 4,679,141, Cl. 364-200.000.

Pommer, Ernst-Heinrich: *See—*
Rentzea, Costin; Sauter, Hubert; Karbach, Stefan; Will, Wolfgang; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,798, Cl. 514-383.000.
Schulz, Guenter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,504, Cl. 71-94.000.

Pomykacek, Josef: *See—*
Protiva, Miroslav; Jilek, Jiri; Cervena, Irena; Dlabac, Antonin; Valchar, Martin; and Pomykacek, Josef, 4,678,788, Cl. 514-254.000.

Pongratz, Leonhard; Kotai, Ferenc; and Spotzl, Markus, to Krauss-Maffei A.G. Device for the centering retention of ammunition in an ammunition receiver. 4,677,894, Cl. 86-45.000.

Ponsford, Roger J.; Pearson, Michael J.; and Finch, Stephen C., to Beecham Group p.l.c. 3S-formamido azetidinone antibacterial agents, their preparation and use. 4,678,782, Cl. 514-210.000.

Pontani, Bernd: *See—*
Lahr, Helfrid; and Pontani, Bernd, 4,678,624, Cl. 376-261.000.

Pontius, Klaus; Settinger, Manfred; and Oster, Lothar, to Klockner Ferromatik Desma GmbH. Device for attaching soles directly to uppers. 4,678,343, Cl. 366-349.000.

Popa, Frank D., to Westinghouse Electric Corp. Nuclear fuel pellet containing gadolinia. 4,678,629, Cl. 376-419.000.

Porter, Julian. Multilayer protection system. 4,678,692, Cl. 428-78.000.

Porter, Vernon R.: *See—*
Scott, Bentley N.; Porter, Vernon R.; and Shortes, Samuel R., 4,678,437, Cl. 434-21.000.

Pospich, Gunther; and Gutte, Richard, to Hoechst Aktiengesellschaft. Hot-melt adhesives of partially saponified vinyl ester copolymers. 4,678,832, Cl. 525-60.000.

Powell, William. Platform for attaching to a ski to provide a monoski. 4,678,200, Cl. 280-607.000.

PPG Industries, Inc.: *See—*
Chang, Wen-Hsuan; Dufford, Edward L.; Erikson, J. Alden; and Prucnal, Paul J., 4,678,835, Cl. 525-100.000.
Tsai, Yih-Wan, 4,678,491, Cl. 65-27.000.

Praba, Krishna; and Profera, Charles E., Jr., to RCA Corporation. Waveguide directional coupler family with a common housing having different sets of conductive block insertable therein. 4,679,011, Cl. 333-111.000.

Praeg, Walter F.: *See—*
Hull, John R.; Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., 4,678,024, Cl. 164-503.000.

Pranger, William F.: *See—*
Vandevier, Joseph E.; Bearden, John L.; Pranger, William F.; and Miller, Harold L., 4,678,399, Cl. 415-199.200.

Prater, Thomas A.: *See—*
Coffin, Louis F., Jr.; and Prater, Thomas A., 4,677,855, Cl. 73-799.000.

Prather, James E.: *See—*
Kellogg, Joseph A.; and Prather, James E., 4,677,840, Cl. 72-465.000.

Prazak, Charles J., III, to Zenith Electronics Corporation. Process of manufacturing for a high-resolution color cathode ray tube. 4,678,447, Cl. 445-45.000.

Precision Measurement, Inc.: *See—*
Kennedy, Lyn R., 4,677,841, Cl. 73-30.000.

Precision Screw Machine Company: *See—*
Greene, Hilliard F., Sr., 4,677,723, Cl. 29-157.10R.

Prentice, Charles E.; and Prentice, Nadine P. Shredder. 4,678,126, Cl. 241-34.000.

Prentice, Nadine P.: *See—*
Prentice, Charles E.; and Prentice, Nadine P., 4,678,126, Cl. 241-34.000.

Preuss, Bernhard; and Berndt, Klaus-Gunther, to Siemens Aktiengesellschaft. Low-voltage circuit breaker having a switching mechanism arranged in a separate chamber. 4,678,873, Cl. 200-18.000.

Price, Timothy D., to Rosemount Engineering Company Limited. Electrical isolation circuit. 4,678,937, Cl. 307-311.000.

Pritchett, James D., to Booth, Inc. Cold plate for beverage dispensing. 4,678,104, Cl. 222-146.600.

Procter & Gamble Company, The: *See—*
Akhter, Lalarukh; Atkinson, Ronald E.; Wages, Dwight E.; and Beyer, Harold H., 4,678,606, Cl. 252-542.000.
Dirksing, Robert S., 4,678,103, Cl. 222-130.000.
Ridley, Gordon, 4,678,593, Cl. 252-131.000.

Procyk, Frank J.: *See—*
Kirsch, Howard C.; and Procyk, Frank J., 4,679,172, Cl. 365-222.000.

Product Investment Incorporated: *See—*
Henning, John C., 4,678,079, Cl. 206-279.000.

Profera, Charles E., Jr.: *See—*
Praba, Krishna; and Profera, Charles E., Jr., 4,679,011, Cl. 333-111.000.

Progress-Elektrogerate Maux & Pfeiffer GmbH & Co.: *See—*
Jacob, Gernot; and Radom, Leon, 4,678,486, Cl. 55-374.000.

Prometrix Corporation: *See—*
Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Mallory, Chester L., 4,679,137, Cl. 364-188.000.

Proprietary Technology, Inc.: *See—*
Bartholomew, Donald D., 4,677,861, Cl. 73-862.540.

Protiva, Miroslav; Jilek, Jiri; Cervena, Irena; Dlabac, Antonin; Valchar, Martin; and Pomykacek, Josef, to Spofa, Spojene Podniky Pro Zdravotnickou Vyrobu. N-substituted 2-chloro-7-fluoro-10-piperazino-10,11-dihydrodibenzo (B,F) thiepins and acid addition salts thereof. 4,678,788, Cl. 514-254.000.

Prsala, Jan. Exercise device to support user's body. 4,678,187, Cl. 272-144.000.

Prucnal, Paul J.: *See*—
Chang, Wen-Hsuan; Dufford, Edward L.; Erikson, J. Alden; and Prucnal, Paul J., 4,678,835, Cl. 525-100.000.

Prud'Hon, Gerard C.: *See*—
Neiger, Henri J. C.; Genot, Claude M.; Prud'Hon, Gerard C.; and Schoens, Michel, 4,678,184, Cl. 272-129.000.

Publishers Equipment Corporation: *See*—
Hermach, Carl J., 4,677,911, Cl. 101-218.000.

Puckert, Franz: *See*—
Duerrschnabel, Wolfgang; Puckert, Franz; Stueer, Heinrich; and Bletschacher, Max, 4,678,637, Cl. 420-490.000.

Pugliese, Joseph A. Collapsible ladder device. 4,678,060, Cl. 182-160.000.

Pulsifer, Paul I.: *See*—
Conway, Larry J.; and Pulsifer, Paul I., 4,679,168, Cl. 364-900.000.

Pum, Reinhard: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.

Pump Engineer Associates, Inc.: *See*—
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,678,040, Cl. 166-370.000.

Punzar, Marianne; Marti, Franz; Mercier, Robert; Tobler, Paul; and Buttiker, Rudolf, to Ciba-Geigy AG. Process for reacting cyanuric chloride with ammonia or with amines. 4,678,852, Cl. 544-194.000.

Purvis, Gene; Phelps, Russell; Dupler, Tim; Landoll, Patrick; and Landoll, Leonard, to Purvis, Gene; Phelps, Russell; and Dupler, Tim. Accumulator for airless spraying apparatus. 4,678,010, Cl. 138-31.000.

Putter, Irving; and Stout, Daniel M., to Merck & Co., Inc. Novel synergistic compositions. 4,678,774, Cl. 514-30.000.

Puzak, Thomas R.: *See*—
Pomerene, James H.; Puzak, Thomas R.; Rechtschaffen, Rudolph N.; Rosenfeld, Philip L.; and Sparacio, Frank J., 4,679,141, Cl. 364-200.000.

Q-Med, Inc.: *See*—
Cox, Michael W.; Levin, Richard I.; Cohen, David J.; and Frisbie, William R., 4,679,144, Cl. 364-417.000.

Quipp Incorporated: *See*—
Sjogren, Christer A.; and D'Amico, Carl, 4,678,387, Cl. 414-47.000.

R. R. Donnelley & Sons Company: *See*—
Robinson, John S.; Ahlswede, Thomas E.; and Cornelius, Charles A., 4,679,153, Cl. 364-523.000.

Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., to General Electric Company. Lighting circuit breaker panelboard modular assembly including circuit breaker indicating clips. 4,679,120, Cl. 361-358.000.

Radek, John R., to Ready Metal Manufacturing Company. Merchandise hanger for slotted wall display panel. 4,678,151, Cl. 248-220.200.

Radians AB: *See*—
Vilhelmsson, Kennet, 4,678,273, Cl. 350-96.300.

Radkowsky, Alvin, to Kernforschungszentrum Karlsruhe GmbH. Nuclear reactor. 4,678,619, Cl. 376-173.000.

Radom, Leon: *See*—
Jacob, Gernot; and Radom, Leon, 4,678,486, Cl. 55-374.000.

Rainer, Alois, to Siemens Aktiengesellschaft. Multiplication unit and method for the operation thereof. 4,679,165, Cl. 364-760.000.

Raiski, Juhani. Assembly for attaching a cutter blade into a chain saw. 4,677,746, Cl. 30-122.000.

Rakovska, Rossitza S.: *See*—
Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.

Raman, Ramas V.: *See*—
Hsu, Shih C.; and Raman, Ramas V., 4,678,720, Cl. 428-606.000.

Rand, Paul K.: *See*—
Newell, Robert E.; Rand, Paul K.; and Osterweil, Carole A., 4,678,106, Cl. 222-162.000.

Rane, Melody A. Disposable baby bottle. 4,678,092, Cl. 215-11.00E.

Rankin, Arthur L., III, to Combustion Engineering, Inc. Highly abrasive resistant material. 4,678,131, Cl. 241-293.000.

Rankin, E. Edward. Side entry sub well logging apparatus and method. 4,678,038, Cl. 166-301.000.

Ransom, Keith C.; and Howitt, Henry G., to Ford Motor Company. Pressure operated valve. 4,678,007, Cl. 137-625.660.

Rapkin, Myron C.; Schoengold, Ronald J.; Shockey, David R.; and Van Rysselberghe, Pierre C., to SmithKline Diagnostics, Inc. Device and method for whole blood separation and analysis. 4,678,757, Cl. 436-169.000.

Raque Food Systems, Inc.: *See*—
Raque, Glen F.; and Robinson, Edward A., 4,678,015, Cl. 141-131.000.

Raque, Glen F.; and Robinson, Edward A., to Raque Food Systems, Inc. Product apportioning system. 4,678,015, Cl. 141-131.000.

Rascoe, Fred H., III: *See*—
Arldt, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., 4,678,175, Cl. 271-34.000.

Raskin, Seymour H. Extruded load cell. 4,677,862, Cl. 73-862.650.

Rathi, Devdas D., to ITT Gilfillan, a division of ITT Corporation. Soft-limited digital pulse compressor. 4,679,210, Cl. 375-96.000.

Rattner, David. Sieve drum. 4,677,761, Cl. 34-108.000.

Rauma-Repola Oy: *See*—
Eloranta, Jarmo, 4,678,165, Cl. 254-97.000.

Ravindranath, Ambrish: *See*—
Dodge, John L.; Bush, Duane B.; Pechuzal, Georges A.; and Ravindranath, Ambrish, 4,678,398, Cl. 415-181.000.

Ray, Siba P., to Aluminum Company of America. Method of forming a substantially interwoven matrix containing a refractory hard metal and a metal compound. 4,678,760, Cl. 501-96.000.

Raychem Corporation: *See*—
Lally, Thomas P., 4,679,179, Cl. 367-162.000.
Tondre, Stephen L.; and Lunk, Hans E., 4,678,709, Cl. 428-380.000.

Raymond, Charles, Jr. Peristaltic diaphragm pump with conically shaped nutating members. 4,678,414, Cl. 418-45.000.

Raytheon Company: *See*—
Schwerdt, Kurt R.; and Levine, Gerald B., 4,678,969, Cl. 315-382.000.

RCA Corporation: *See*—
Alpaiwalla, Feroz K.; and Begeman, Robert H., 4,678,929, Cl. 307-112.000.
Beaulieu, Andre R., 4,678,271, Cl. 350-96.200.
Booth, David E.; Smith, Steven G.; and Adams, John L., 4,678,448, Cl. 445-60.000.
Erhardt, Harry G., 4,679,090, Cl. 358-213.260.
Filliman, Paul D., 4,679,131, Cl. 363-21.000.
Miyatani, Kazuo; and Sato, Isao, 4,678,292, Cl. 350-609.000.
Praba, Krishna; and Profera, Charles E., Jr., 4,679,011, Cl. 333-111.000.
Reese, Robert M.; and Landry, Norman R., 4,678,863, Cl. 174-35.0GC.
Toda, Minoru, 4,678,955, Cl. 310-328.000.
Topper, Robert J.; and Dischert, Robert A., 4,679,084, Cl. 358-160.000.

Ready Metal Manufacturing Company: *See*—
Radek, John R., 4,678,151, Cl. 248-220.200.

Reames, Stephen P.: *See*—
Jensen, Gordon A.; Reames, Stephen P.; Morris, Jerry D.; and Neal, Scott S., 4,679,193, Cl. 370-94.000.

Rearick, Thomas C., to United States of America, Army. Digital high speed programmable convolver. 4,679,164, Cl. 364-728.000.

Recherches et Etudes d'Optique et de Sciences Connexes: *See*—
Jacques, Paseri, 4,678,293, Cl. 350-609.000.

Rechtschaffen, Rudolph N.: *See*—
Pomerene, James H.; Puzak, Thomas R.; Rechtschaffen, Rudolph N.; Rosenfeld, Philip L.; and Sparacio, Frank J., 4,679,141, Cl. 364-200.000.

Recker, William J.: *See*—
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,678,040, Cl. 166-370.000.

Rediffusion Simulation Limited: *See*—
Bashford, Dennis J.; and Blackham, Geoffrey H., 4,679,080, Cl. 358-150.000.

Reed, John A.: *See*—
Logwood, Dennis J.; Haq, Mohammed E. U.; Reed, John A.; and Karp, Joel A., 4,679,171, Cl. 365-154.000.

Reese, George; Spielmaker, Richard; and Schatz, Douglas, to Advanced Energy, Inc. Matching circuit for delivering radio frequency electromagnetic energy to a variable impedance load. 4,679,007, Cl. 333-17.00M.

Reese, Robert M.; and Landry, Norman R., to RCA Corporation. Corrosion resistant conductive elastomers. 4,678,863, Cl. 174-35.0GC.

Regnault, Alain: *See*—
Rutherford, David G.; Regnault, Alain; and Kirlick, John, 4,679,094, Cl. 358-261.000.

Rehbein, Clayton J.; and Battin, Leland B., Jr., to Motorola Inc. Safety latching assembly for electronics equipment with external battery pack. 4,678,215, Cl. 292-247.000.

Reheat AB: *See*—
Almqvist, Christer, 4,678,030, Cl. 165-166.000.

Reichardt, Manfred; and Loss, Rolf D., to Allied Corporation. Contact element. 4,678,262, Cl. 439-857.000.

Reichle, Hans, to Reichle+De Massari AG Elektroingenieure. Telephone accessory housing. 4,679,231, Cl. 379-396.000.

Reichle+De Massari AG Elektroingenieure: *See*—
Reichle, Hans, 4,679,231, Cl. 379-396.000.

Reiling, Gilbert H., to General Electric Company. Metallic halide electric discharge lamps. 4,678,960, Cl. 313-25.000.

Reilly, David M.; and Uber, Arthur E., III, to Medrad, Inc. Angiographic injector and angiographic syringe for use therewith. 4,677,980, Cl. 128-655.000.

Reinecke, Paul: *See*—
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.

Reist, Walter, to Ferag AG. Apparatus for picking-up and further transporting, folded printed products, especially signatures or sheets, from a conveying device. 4,678,174, Cl. 270-54.000.

Reiterer, Walther, to Durst Phototechnik GmbH. Measuring device for selecting the filter in photographic enlarging or copying apparatuses. 4,678,319, Cl. 355-38.000.

Reitz, Robert R., to Du Pont de Nemours, E. I., and Company. Ethylene copolymers with enhanced fire resistant properties. 4,678,607, Cl. 252-609.000.

Rembaum, Alan, to California Institute of Technology. Polyacrolein microspheres. 4,678,814, Cl. 522-175.000.

Remington, Richard C., to Kidde, Inc. (Presto Lock Company Division). Luggage latching system. 4,677,832, Cl. 70-67.000.
Rendu, Michel: *See—*
Loriot, Pierre; Rendu, Michel; Rousseau, Jean; and Samoel, Alain, 4,678,924, Cl. 29-407.000.
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Retallick, William B., to Camet, Inc. Apparatus for shaping a spiral catalyst support. 4,677,839, Cl. 72-402.000.
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Palmer, Emery A.; Shimanski, Michael A.; Ellison, Thomas M.; and Everidge, Jack P., 4,678,690, Cl. 428-31.000.
Reyloc Limited: *See—*
Cheng, Eric K., 4,678,152, Cl. 248-225.100.
Reynolds, Bruce C.: *See—*
Herbert, William G., Jr.; Grey, Henry G.; and Reynolds, Bruce C., 4,678,691, Cl. 428-36.000.
Rezhets, Vadim: *See—*
Jandeska, William F., Jr.; and Rezhets, Vadim, 4,678,510, Cl. 75-244.000.
RFD Limited: *See—*
Edwards, David V.; and Newman, Michael A., 4,678,443, Cl. 441-38.000.
Rheinmetall GmbH: *See—*
Boecker, Juegen; Gersbach, Klaus; and Bethmann, Karl W., 4,677,915, Cl. 102-517.000.
Rhodes, Marvin D.: *See—*
Mikulas, Martin M., Jr.; Rhodes, Marvin D.; and Simonton, J. Wayne, 4,677,803, Cl. 52-646.000.
Rhone-Poulenc Agrochimie: *See—*
Barlet, Denis; and Alain, Dini, 4,678,503, Cl. 71-93.000.
Ricard, Jacques J. L., to Ricard, Suoma; and Ricard, Thomas. Method of using immunizing commensals. 4,678,669, Cl. 424-93.000.
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Rich, Jonathan D., to General Electric Company. Siliconarylozides and siliconarylisocyanates. 4,678,610, Cl. 260-349.000.
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Heide, Jorgen, 4,679,240, Cl. 381-68.600.
Richardson, Charles P.; Kuhl, Virgil; Gasparaitis, Bernard; Staple, Bruce; and Krieg, Larry M., to Motorola, Inc. Microphone. 4,679,233, Cl. 379-433.000.
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Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. Triazole antifungal agents. 4,678,789, Cl. 514-262.000.
Richardson, Michael M.; and Schaffer, Douglas A., to Kroy Inc. Tape supply cartridge. 4,678,353, Cl. 400-248.000.
Richter, Herbert, to Herbert Richter, Metallwaren-Apparatebau GmbH & Co. Magazine for recording tape cassettes. 4,678,081, Cl. 206-387.000.
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Bisaiji, Takashi, 4,678,318, Cl. 355-15.000.
Funato, Hiroyoshi, 4,678,263, Cl. 350-3.710.
Inokuchi, Toshiyuki, 4,678,321, Cl. 355-52.000.
Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.
Ohta, Wasaburo; Enomoto, Takamichi; and Uehara, Kiyohiro, 4,678,285, Cl. 350-345.000.
Tanaka, Shigetaka, 4,679,208, Cl. 375-13.000.
Yamaguchi, Shingo, 4,679,229, Cl. 379-373.000.
Ridley, Gordon, to Procter & Gamble Company, The. Transparent or translucent toilet bars containing a smectite-type clay. 4,678,593, Cl. 252-131.000.
Rieger, Wolfhart: *See—*
Kampfer, Konrad; Rieger, Wolfhart; Gauckler, Ludwig; and Dellapina, Marco, 4,678,758, Cl. 501-80.000.
Ries, Edward. Variable displacement vane pump or motor. 4,678,413, Cl. 418-29.000.
Riffiod, Michel M. R., to U.S. Philips Corporation. Delay simulator for FM-CW range measuring apparatus. 4,679,049, Cl. 342-172.000.
Righini, Giancarlo: *See—*
Russo, Vera; Sottini, Stefano; Righini, Giancarlo; and Trigari, Silvana, 4,678,268, Cl. 350-96.180.
Riglietti, Antonio, to ALTA S.p.A. Hand operated liquid atomizer. 4,678,122, Cl. 239-333.000.
Rignon, Maurice; Catonne, Jean-Claude; Denisard, Francoise; and Malafosse, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for making amino alcohols by electrochemical reduction of nitro alcohols. 4,678,549, Cl. 204-74.000.
Rigsbee, Everett O., III: *See—*
Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Rigsbee, Everett O., III; and Teener, Michael D., 4,679,191, Cl. 370-84.000.
Riley, Beatrice W. Universally adjustable quilting frame. 4,677,775, Cl. 38-102.200.
Ritzl, Antal; and Zehnder, Jurg, to Swiss Aluminium Ltd. Covered goods truck, in particular silo truck. 4,678,225, Cl. 296-181.000.
Rivas, Nelson; and Beichel, Rudi, to WorldTech Atlantis Inc. Method and apparatus for secondary and tertiary recovery of hydrocarbons. 4,678,039, Cl. 166-303.000.
Robblee, Lois S., to EIC Laboratories, Inc. Iridium oxide coated electrodes for neural stimulation. 4,677,989, Cl. 128-784.000.
Robert Bosch GmbH: *See—*
Hafner, Udo; Hans, Waldemar; Kind, Wilhelm; Krauss, Rudolf; and Sauer, Rudolf, 4,678,124, Cl. 239-585.000.
Hess, Heinz; and Peth, Horst, 4,679,064, Cl. 358-24.000.
Knoll, Peter, 4,679,044, Cl. 340-815.200.
Leiber, Heinz, 4,678,243, Cl. 303-114.000.
Pape, Werner, 4,677,951, Cl. 123-357.000.
Robert Krause GmbH & Co. KG: *See—*
Kissel, Karl-Heinz; and Oevermann, Siegfried, 4,678,357, Cl. 402-39.000.
Roberts, David; and Johnson, Henry S., to King Taudevin & Gregson (Holdings) Limited. Vitrification of asbestos waste. 4,678,493, Cl. 65-134.000.
Robertson, James C.: *See—*
Baker, William R.; Marulic, Walter J.; and Robertson, James C., 4,677,918, Cl. 105-378.000.
Robinson, David W.: *See—*
Sanders, Ward L.; and Robinson, David W., 4,678,171, Cl. 269-325.000.
Robinson, Edward A.: *See—*
Raque, Glen F.; and Robinson, Edward A., 4,678,015, Cl. 141-131.000.
Robinson, John S.; Ahlswede, Thomas E.; and Cornelius, Charles A., to R. R. Donnelley & Sons Company. Printing systems for typesetter emulation. 4,679,153, Cl. 364-523.000.
Rock, Dan; Roth, Mark; and Sagan, Stephen F. Broadband spectrometer with fiber optic reformattor. 4,678,332, Cl. 356-328.000.
Rockwell International Corporation: *See—*
Moore, Larry V., 4,678,252, Cl. 439-62.000.
Rodal, David R.: *See—*
Williams, Marshall; and Rodal, David R., 4,679,098, Cl. 360-10.100.
Rodrigue, Roland; and Rodrigue, Ronnie. Boat and propulsion system. 4,678,440, Cl. 440-53.000.
Rodrigue, Ronnie: *See—*
Rodrigue, Roland; and Rodrigue, Ronnie, 4,678,440, Cl. 440-53.000.
Rodriguez, Anthony R. Elevator display system. 4,677,779, Cl. 40-514.000.
Rodriguez, Domingo; and Schemel, Roberto, to Intevep, S.A. Process for the regeneration of spent catalyst used in the upgrading of heavy hydrocarbon feedstocks. 4,678,557, Cl. 208-112.000.
Roe, Anthony M.; Coates, William J.; Slater, Robert A.; Breukelman, Stephen P.; and Meakins, George D., to Smith Kline & French Laboratories Limited. Pharmaceutical compositions having β-adrenoceptor antagonist activity employing pyridazinone derivatives. 4,678,786, Cl. 514-247.000.
Roe, Homer D. Variable pitch propeller. 4,678,402, Cl. 416-157.00R.
Rogers, Alvin J.: *See—*
Fishman, Herbert; and Rogers, Alvin J., 4,678,169, Cl. 269-46.000.
Rohm and Haas Company: *See—*
Dupre, Jean; and Keenan, Andrea C., 4,678,596, Cl. 252-174.240.
Rohner, Gerhard; Schweikert, Willi; and Ticks, Gerd-Heinz, to Carl Freudenberg, Firma. Air spring. 4,678,203, Cl. 280-707.000.
Roller, George J., to Xerox Corporation. Front air knife top vacuum corrugation feeder. 4,678,176, Cl. 271-94.000.
Rolls-Royce plc: *See—*
Bridges, Stuart A.; and Goddard, John, 4,678,113, Cl. 228-160.000.
Rolyan Manufacturing Co. Inc: *See—*
Lindemann, Peer, 4,677,971, Cl. 128-87.00R.
Romine, Edward L.; and Byczek, Roger W., to Methode Electronics, Inc. Multi-pin electrical header. 4,678,250, Cl. 439-83.000.
Roodvoets, David L., to Dow Chemical Company, The. Lightweight roofing system. 4,677,800, Cl. 52-309.120.
Roos, Ernst: *See—*
Kruger, Bernd-Wieland; Hoffmann, Hellmut; Roos, Ernst; and Behrenz, Wolfgang, 4,678,777, Cl. 514-110.000.
Roschier, Nils-Robert, to Elevator GmbH. Procedure and means for producing a contrast image. 4,679,032, Cl. 340-562.000.
Rosemount Engineering Company Limited: *See—*
Price, Timothy D., 4,678,937, Cl. 307-311.000.
Rosenberg, Peretz. Quick-action on/off valve. 4,678,004, Cl. 137-469.000.
Rosenfeld, Jerold C., to Celanese Corporation. Stabilization of aromatic polyesters with dimercaptothiadiazole. 4,678,825, Cl. 524-83.000.
Rosenfeld, Philip L.: *See—*
Pomerene, James H.; Puzak, Thomas R.; Rechtschaffen, Rudolph N.; Rosenfeld, Philip L.; and Sparacio, Frank J., 4,679,141, Cl. 364-200.000.
Rosenthal, Michael R.: *See—*
Parron, Ivan; and Rosenthal, Michael R., 4,677,794, Cl. 52-36.000.
Rosenwald, Peter L. Internal medication delivery method and vehicle. 4,678,466, Cl. 604-891.000.
Rosinski, Edward J., to Mobil Oil Corporation. Enhancement of shape selectivity of zeolites. 4,678,766, Cl. 502-85.000.
Rosner, Mark S. Portable rapid massive parenteral fluid warming and infusion apparatus. 4,678,460, Cl. 604-113.000.
Ross Bicycles Inc.: *See—*
Ross, Sherwood B., 4,678,090, Cl. 211-150.000.

Ross, Sherwood B., to Ross Bicycles Inc. Latch. 4,678,090, Cl. 211-150.000.

Rossi, Victor L.: *See*—
Butts, Gary; Sydo, Lukas; and Rossi, Victor L., 4,678,347, Cl. 384-43.000.

Rostrup-Nielsen, Jens R.: *See*—
Stahl, Henrik O.; and Rostrup-Nielsen, Jens R., 4,678,600, Cl. 252-373.000.

Rotella, Thomas B. Stock price tracking apparatus. 4,677,933, Cl. 116-313.000.

Roth, Herman. Knockdown housing structure. 4,677,797, Cl. 52-94.000.

Roth, Mark: *See*—
Rock, Dan; Roth, Mark; and Sagan, Stephen F., 4,678,332, Cl. 356-328.000.

Rothermel, Wilfried: *See*—
Hempel, Hans D.; Horn, Jurgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ullrich, 4,678,753, Cl. 435-296.000.

Rothman, Douglas L.: *See*—
Avison, Malcolm J.; Hetherington, Hoby P.; Jue, Thomas H.; and Rothman, Douglas L., 4,678,995, Cl. 324-309.000.

Rotomors S.p.A: *See*—
Bertorello, Mario, 4,678,077, Cl. 198-803.010.

Rott, Hans: *See*—
Fock, Jurgen; and Rott, Hans, 4,678,599, Cl. 252-343.000.

Rousseau, Jean: *See*—
Loriot, Pierre; Rendu, Michel; Rousseau, Jean; and Samoel, Alain, 4,678,924, Cl. 29-407.000.

Rouzies, Christian, to Centre National d'Etudes Spatiales. DC power supply with adjustable operating point. 4,678,983, Cl. 323-222.000.

Rowe, David W.: *See*—
Shirey, Phillip G.; Rowe, David W.; and Waynick, William R., 4,678,027, Cl. 165-70.000.

Rowe International, Inc.: *See*—
Hoffman, David; Verduin, Lee C.; and Ouwinga, Ross, 4,677,777, Cl. 40-460.000.

Rowe, W. Bruce: *See*—
Cotter, Richard; Johnson, Robert C.; Rowe, W. Bruce; and Young, Susan K., 4,678,807, Cl. 514-552.000.

Rowe, William S.; and Chao, Fred C., to General Electric Company. Transient monitor for nuclear reactor. 4,678,622, Cl. 376-259.000.

Roxor Corporation: *See*—
Blom, C. James, 4,678,280, Cl. 350-320.000.

Roy, Glenn M.: *See*—
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,678,674, Cl. 426-548.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,678,675, Cl. 426-548.000.

Rube, Friedbert: *See*—
Heinrich, Peter; Knop, Klaus; and Rube, Friedbert, 4,678,480, Cl. 48-197.00R.

Rubio, Richard. Tailgate latch mechanism. 4,678,212, Cl. 292-7.000.

Ruble, Marshall V., to Iowa State University Research Foundation, Inc. Method and means for determining the ease with which a cow may give birth to a calf. 4,678,893, Cl. 235-70.00R.

Rudershausen, Charles G., to Du Pont de Nemours, E. I., and Company. Synthesis of fluorochloromethanes. 4,678,859, Cl. 570-163.000.

Rudi, Alain; and Bertot, Maurice, to Aciers et Outillage Peugeot. Device for transmitting through an optical coupling data issuing from a steering wheel to an element mounted on a vehicle. 4,678,906, Cl. 250-227.000.

Rudland, Peter E., to Time and Data Systems International Limited. Identification card with improved concealed coding and an optical swipe reader housing for use with it. 4,678,898, Cl. 235-468.000.

Rudy, Richard M.; and Fitzgerald, Thomas J. Liquid level sensor for controlling pump operation. 4,678,403, Cl. 417-12.000.

Ruetgerswerke Aktiengesellschaft: *See*—
Giebeler, Eberhard; and Wilhelm, Gerhard, 4,678,715, Cl. 428-537.100.

Runkle, Charles J.: *See*—
Otstot, Roger S.; and Runkle, Charles J., 4,678,573, Cl. 210-321.100.

Runyon, Peter M.: *See*—
Larson, Donald A.; and Runyon, Peter M., 4,677,791, Cl. 49-463.000.

Russo, Vera; Sottini, Stefano; Righini, Giancarlo; and Trigari, Silvana, to Consiglio Nazionale Delle Ricerche Roma. Method and apparatus for constructing microlens ends for optical fibers. 4,678,268, Cl. 350-96.180.

Rutherford, David G.; Regnault, Alain; and Kirlick, John, to Associated Press, The. Method for compression and transmission of video information. 4,679,094, Cl. 358-261.000.

Rutzen, Horst: *See*—
Geke, Juergen; and Rutzen, Horst, 4,678,605, Cl. 252-547.000.

Ryan, James M.; Golden, Sanford S.; and Sliker, Larry, to Henry Dreyfuss Associates; and Golden Associates. Reclining chair. 4,678,229, Cl. 297-68.000.

Ryder, Geoffrey A., to Beecham Group p.l.c. Container having a hooked-shaped member slidably attached thereto. 4,678,102, Cl. 222-181.000.

Rylatt, John A., to Westinghouse Electric Corp. Debris-retaining trap for a fuel assembly. 4,678,627, Cl. 376-313.000.

S. & M. Cannon Pty. Ltd.: *See*—
Cannon, Stuart R.; Brazenor, William J.; Kneen, Peter W.; and Mullen, John L., 4,677,999, Cl. 135-117.000.

Saaski, Elric W.; and Hartl, James C., to Technology Dynamics, Inc. Optical measuring device using a spectral modulation sensor having an optically resonant structure. 4,678,904, Cl. 250-227.000.

Sachdev, Krishna G.: *See*—
Pennington, Keith S.; Afzali-Ardakani, Ali; and Sachdev, Krishna G., 4,678,701, Cl. 428-213.000.

Sadamori, Yuuichi; and Maeda, Keini, to Mitsubishi Denki Kabushiki Kaisha. Sequencing data transmission process. 4,679,045, Cl. 340-825.070.

Saegusa, Noboru: *See*—
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.

Saeki, Osamu; Mori, Kenji; Onoda, Mamoru; Watanabe, Ryo; Shinohara, Katsufumi; Ashie, Takehiko; and Imanishi, Nobuyuki, to Kabushiki Kaisha Kobe Seiko Sho. Method for fluidized bed reduction of iron ore. 4,678,508, Cl. 75-26.000.

Sagan, Stephen F.: *See*—
Rock, Dan; Roth, Mark; and Sagan, Stephen F., 4,678,332, Cl. 356-328.000.

Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Frequency divider circuit and frequency synthesizer using the same. 4,679,003, Cl. 331-1.00A.

Sahara, Hiroshi: *See*—
Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, 4,678,934, Cl. 307-279.000.

Said, Ronald S. Apparatus for mounting application heads to an agricultural implement. 4,677,787, Cl. 47-1.500.

St. Louis, Robert M., to Camco Inc. Drier storable rack. 4,677,760, Cl. 34-90.000.

Saito, Yukio: *See*—
Okita, Masao; Gunji, Kunihiko; and Saito, Yukio, 4,679,106, Cl. 360-99.000.

Saitoh, Hajime; and Maeda, Morio, to Sumitomo Heavy Industries, Ltd. Electromagnetic-induction heater with magnetic field control. 4,678,883, Cl. 219-10.61R.

Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, to Canon Kabushiki Kaisha. Member having light receiving layer of A-Si: Ge (C,N,O) A-Si/surface antireflection layer with non-parallel interfaces. 4,678,733, Cl. 430-57.000.

Saitoh, Makoto: *See*—
Aoyagi, Masaru; and Saitoh, Makoto, 4,679,177, Cl. 367-132.000.

Saitoh, Taichi: *See*—
Kanai, Yasunori; and Saitoh, Taichi, 4,678,942, Cl. 307-455.000.

Saka, Hiroshi: *See*—
Tanaka, Toshihide; Saka, Hiroshi; Yoshimura, Yoshikazu; and Shiomi, Yasuhumi, 4,679,249, Cl. 455-328.000.

Sakai, Itaru: *See*—
Ikariya, Takao; Itagaki, Masanori; Mizuguchi, Masatsugu; Sakai, Itaru; and Tajima, Osamu, 4,678,856, Cl. 560-24.000.

Sakaki, Hirokazu: *See*—
Nakanishi, Haruo; Sakaki, Hirokazu; Yamazaki, Toru; and Okishi, Yoshio, 4,678,551, Cl. 204-129.750.

Sakakibara, Kazuhiko; and Kuwata, Yutaka, to Nippon Telegraph and Telephone Corporation. Series resonant converter. 4,679,129, Cl. 363-17.000.

Sakamoto, Hiroshi: *See*—
Kikuchi, Masafumi; Onodera, Toshio; Toyama, Sumio; and Sakamoto, Hiroshi, 4,679,091, Cl. 358-242.000.

Sakimoto, Seiichiro; Fujita, Kazuo; Yamauchi, Yutaka; and Matsue, Hiroshi, to Showa Denko K. K. Coated particulate materials and method for manufacture thereof. 4,678,710, Cl. 428-407.000.

Saks, Thomas J.: *See*—
Hicks, Loy A., Jr.; Sherwood, Edward P.; and Saks, Thomas J., 4,678,253, Cl. 439-210.000.

Sakuda, Osamu: *See*—
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.

Sakuma, Masato: *See*—
Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihiro; and Makishima, Tokuo, 4,678,767, Cl. 502-104.000.

Sakuragi, Masako; and Ichimura, Kunihiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Chelate, crosslinked polyethyleneimine resin having 2-hydroxy benzoyl group. 4,678,844, Cl. 525-417.000.

Sakurai, Hideya: *See*—
Miyamoto, Toshinobu; Hayashi, Hiroo; Sakurai, Hideya; Takabayashi, Hirofumi; and Ohnishi, Youichi, 4,679,022, Cl. 335-296.000.

Salomon S.A.: *See*—
Benoit, Louis; Mabboux, Michel; Nerrinck, Bernard; and De Marchi, Jean-Louis, 4,677,768, Cl. 36-117.000.
De Marchi, Jean-Louis; Mabboux, Michel; Paris, Jean; and Kopp, Norbert, 4,677,770, Cl. 36-120.000.

Samoel, Alain: *See*—
Loriot, Pierre; Rendu, Michel; Rousseau, Jean; and Samoel, Alain, 4,678,924, Cl. 29-407.000.

Sampson, Robert L. Log holder device. 4,678,170, Cl. 269-296.000.

Sanagi, Shiroh: *See*—
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,678,522, Cl. 148-12.00C.

Sand, Michael L., to Hercules Incorporated. Method for impregnating a thermoplastic polymer. 4,678,684, Cl. 427-213.360.
Sanden Corporation: *See*—
Koisuka, Mikio; and Aoki, Hisao, 4,678,112, Cl. 228-138.000.
Sanders, Ward L.; and Robinson, David W., to American Sterilizer Company. Positioning lift for surgical table. 4,678,171, Cl. 269-325.000.
Sandgren, Lage M.: *See*—
Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Axegård, Peter A., 4,678,654, Cl. 423-478.000.
Sandler, Stanley R., to Pennwalt Corporation. Poly(fluoroacetylene) containing polymers. 4,678,842, Cl. 525-359.100.
Sando, Daniel D. Apparatus for the display and storage of mattresses. 4,678,085, Cl. 211-28.000.
Sandvik Kosta GmbH: *See*—
Schmid, Herbert; and Hiestand, Karl, 4,677,885, Cl. 82-40.00R.
Sani-Fresh International, Inc.: *See*—
Heck, Samuel C., 4,678,105, Cl. 222-153.000.
Sanjoh, Akira: *See*—
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, 4,678,731, Cl. 430-65.000.
Sano, Tetsuhiro: *See*—
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Sano, Yasuro: *See*—
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Sanshin Kogyo Kabushiki Kaisha: *See*—
Iwai, Tomio; and Matsushita, Yukio, 4,677,826, Cl. 60-602.000.
Nishimura, Seiichi; and Takayasu, Hidekazu, 4,677,944, Cl. 123-73.00B.
Santa Barbara Research Center: *See*—
Kern, Mark T.; and Cinzori, Robert J., 4,679,156, Cl. 364-551.000.
Santarelli, Paul: *See*—
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,678,214, Cl. 292-213.000.
Sanwa Kagaku Kenkyusho Co., Ltd.: *See*—
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.
Sapal, Societe Anonyme des Plieuses Automatiques: *See*—
Chenevard, Alexis, 4,677,808, Cl. 53-238.000.
Sapporo Breweries, Ltd.: *See*—
Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegasi, Takasi; and Yamaoka, Isao, 4,677,934, Cl. 118-58.000.
Sarrantonio, August C., to Grumman Aerospace Corporation. Aircraft launcher and retriever. 4,678,141, Cl. 244-2.000.
Sartorius GmbH: *See*—
Nodes, Rudolf; and Hoffmann, Jurgen, 4,678,578, Cl. 210-445.000.
Sasaki, Hisami: *See*—
Nakamura, Kazuhito; Sasaki, Hisami; Chigira, Masayoshi; and Yokoi, Kenji, 4,678,590, Cl. 252-8.800.
Sasaki, Isao; and Mukai, Nobuhiro, to Mitsubishi Rayon Co., Ltd. Compositions for artificial marbles and process for producing artificial marbles therefrom. 4,678,819, Cl. 523-171.000.
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, to Hitachi Cable, Ltd.; and Hitachi, Ltd. Evaporating heat transfer wall. 4,678,029, Cl. 165-133.000.
Sasaya, Hideaki: *See*—
Fukami, Akira; Oshiro, Takao; and Sasaya, Hideaki, 4,678,118, Cl. 237-12.30B.
Sato, Isao: *See*—
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
Miyatani, Kazuo; and Sato, Isao, 4,678,292, Cl. 350-609.000.
Sato, Kazuyuki, to Kabushiki Kaisha Toshiba. Sequential access LSI memory circuit for pattern generator. 4,679,173, Cl. 365-233.000.
Sato, Kozo: *See*—
Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masasi; and Tsukase, Masaaki, 4,678,735, Cl. 430-203.000.
Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.
Sato, Mitsuo: *See*—
Imanishi, Shozo; and Sato, Mitsuo, 4,677,908, Cl. 100-53.000.
Sato, Susumu; and Okamoto, Keizo, to Bridgestone Corporation. Tire tread rubber composition. 4,678,830, Cl. 524-495.000.
Sato, Susumu: *See*—
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, 4,678,921, Cl. 250-574.000.
Sato, Tsunehiko: *See*—
Asai, Takamitsu; Akashi, Goro; Kitamoto, Tatsuji; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,678,682, Cl. 427-48.000.
Sato, Yuichi; Tsunekawa, Tokuichi; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Distance measuring devices and light integrators therefor. 4,678,323, Cl. 365-4.000.
Satow, Takashi: *See*—
Kawamura, Toshimi; and Satow, Takashi, 4,679,020, Cl. 335-216.000.
Sauer, Rudolf: *See*—
Hafner, Udo; Hans, Waldemar; Kind, Wilhelm; Krauss, Rudolf; and Sauer, Rudolf, 4,678,124, Cl. 239-585.000.
Sauter, Hubert: *See*—
Rentzea, Costin; Sauter, Hubert; Karbach, Stefan; Will, Wolfgang; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,798, Cl. 514-383.000.
Savage, Jack W.: *See*—
Lehnhoff, Richard N.; and Savage, Jack W., 4,678,972, Cl. 318-254.000.
Savin Corporation: *See*—
Grossinger, Israel, 4,678,317, Cl. 355-14.00D.
Landa, Benzion, 4,678,177, Cl. 271-238.000.
Savinykh, Vitaly V.: *See*—
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.
Savolainen, Erkki: *See*—
Niiranen, Tapani; Savolainen, Erkki; and Kohonen, Raimo, 4,678,574, Cl. 210-327.000.
Sawada, Shinichi: *See*—
Tada, Koji; Tatsumi, Masami; Kotani, Toshihiro; and Sawada, Shinichi, 4,678,534, Cl. 156-607.000.
Sawafuji, Tadaaki: *See*—
Honda, Kenji, deceased; and Sawafuji, Tadaaki, 4,677,818, Cl. 57-224.000.
Sawatari, Takeo; Nakamura, Mitsutaka; and Sugiura, Toshihiro, to Aisin Seiki Kabushiki Kaisha. Automotive engine oil monitoring system. 4,677,847, Cl. 73-64.000.
Sawyer, Sammy D.: *See*—
Berger, Michael F.; and Sawyer, Sammy D., 4,679,166, Cl. 364-900.000.
Scalamandre, Fred: *See*—
Scalamandre, Joseph; and Vigilante, John J., 4,678,156, Cl. 249-34.000.
Scalamandre, Joseph; and Vigilante, John J., to Scalamandre, Fred; and Vigilante, Michael L., a part interest. Reusable concrete forms with spacer/tierods. 4,678,156, Cl. 249-34.000.
Scarffe, Michael F.: *See*—
Simon, Lewis A.; and Scarffe, Michael F., 4,677,756, Cl. 33-514.000.
Schafer, Clyde K.: *See*—
Krishnakumar, C. K.; and Schafer, Clyde K., 4,678,116, Cl. 236-25.00A.
Schaffer, Douglas A.: *See*—
Richardson, Michael M.; and Schaffer, Douglas A., 4,678,353, Cl. 400-248.000.
Schaffer, Ronald R.: *See*—
Bowen, Terry P.; Glover, Douglas W.; Hoover, Charles D.; Huber, John H.; and Schaffer, Ronald R., 4,678,264, Cl. 350-96.200.
Schapira, Joseph; Ken, Victor; Thery, Denis; and Jelodin, Stephane, to Compagnie Francaise de Produits Industriels. Method of zinc phosphatization, activation and refining bath used in said method and corresponding concentrate. 4,678,519, Cl. 148-6.15Z.
Schatz, Douglas: *See*—
Reese, George; Spielmaker, Richard; and Schatz, Douglas, 4,679,007, Cl. 333-17.00M.
Scheer, Martin: *See*—
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.
Schemel, Roberto: *See*—
Rodriguez, Domingo; and Schemel, Roberto, 4,678,557, Cl. 208-112.000.
Schemm, Theodor: *See*—
Gregory, Dieter, 4,678,216, Cl. 292-256.690.
Schenten, James L., to Chrysler Motors Corporation. Rear spring actuated brake proportioner. 4,678,240, Cl. 303-6.00C.
Scherbing, F. J., Jr., executor: *See*—
Scherbing, Frank J., deceased; and Scherbing, F. J., Jr., executor, 4,677,833, Cl. 70-68.000.
Scherbing, Frank J., deceased; and by Scherbing, F. J., Jr., executor, to Warrior Corporation. Bag lock. 4,677,833, Cl. 70-68.000.
Schering Aktiengesellschaft: *See*—
Franke, Helga; Franke, Heinrich; Kruger, Hans-Rudolf; and Joppien, Hartmut, 4,678,811, Cl. 514-721.000.
Schindl, Klaus P.: *See*—
Nyman, Georg N.; Pauliny, Ferdinand; and Schindl, Klaus P., 4,678,291, Cl. 350-510.000.
Schleisner, Uriel. Structural connector. 4,677,805, Cl. 52-648.000.
Schlesinger, Ulrich: *See*—
Back, Gerhard; Schutz, Hans U.; and Schlesinger, Ulrich, 4,678,851, Cl. 534-619.000.
Schlichthorst, Norbert, to Blohm & Voss AG. Engine installation for use in a ship. 4,678,439, Cl. 440-11.000.
Schlosser, Erich J.: *See*—
Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, 4,677,964, Cl. 126-41.00R.
Schlumberger Technology Corporation: *See*—
Ayoub, Joseph; and Bourdet, Dominique, 4,677,849, Cl. 73-155.000.
Goldschild, Pierre, 4,678,035, Cl. 166-250.000.
Schmid, Herbert; and Hiestand, Karl, to Sandvik Kosta GmbH; and SMW Schneider & Weisshaupt GmbH. Face driver for centering and driving workpieces chucked in a lathe. 4,677,885, Cl. 82-40.00R.
Schmid, Titus: *See*—
Eichenberger, Hansulrich; Lacher, Ludwig; and Schmid, Titus, 4,677,710, Cl. 19-218.000.

Schmidt, Samuel, to United Technologies Corporation. Inductive displacement transducer with unipolar output. 4,678,991, Cl. 324-207.000.

Schmidts, Kurt: *See*—
Schoettle, Klaus; Schmidts, Kurt; Kamm, Eugen; and Berger, Heinz, 4,679,110, Cl. 360-132.000.

Schmitt, Kenneth J.: *See*—
Eastlund, Bernard J.; Schmitt, Kenneth J.; and Bass, Ronald M., 4,678,034, Cl. 166-248.000.

Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. Measuring device error monitoring system. 4,678,948, Cl. 307-511.000.

Schmitz, Herman J. R.; Annegarn, Marcellinus J. J. C.; and Fekkes, Wilhelmus F., to U.S. Philips Corporation. Teletext device with reduced page-access time. 4,679,083, Cl. 358-147.000.

Schmolka, Irving R., to BASF Corporation. Mineral oil gels. 4,678,664, Cl. 424-65.000.

Schneider, Josef F., to United States of America, Air Force. Charge depletion meter. 4,678,999, Cl. 324-427.000.

Schneller, Arnold; Herwig, Walter; and Erbes, Kurt, to Hoechst Aktiengesellschaft. Radiation-sensitive composition and recording material based on compounds which can be split by acid. 4,678,737, Cl. 430-270.000.

Schoengold, Ronald J.: *See*—
Rapkin, Myron C.; Schoengold, Ronald J.; Shockey, David R.; and Van Rysselberghe, Pierre C., 4,678,757, Cl. 436-169.000.

Schoens, Michel: *See*—
Neiger, Henri J. C.; Genot, Claude M.; Prud'Hon, Gerard C.; and Schoens, Michel, 4,678,184, Cl. 272-129.000.

Schoettle, Klaus, to BASF Aktiengesellschaft. Tape cassette having a mounting for a leg spring for a reel brake spring. 4,678,140, Cl. 242-199.000.

Schoettle, Klaus; Schmidts, Kurt; Kamm, Eugen; and Berger, Heinz, to BASF Aktiengesellschaft. Brake and tape tensioning means for tape cassettes having flanged reels, and a tape cassette, in particular a magnetic tape cassette, including these means. 4,679,110, Cl. 360-132.000.

Scholl, Inc.: *See*—
Gudas, Charles J., 4,677,766, Cl. 36-43.000.

Scholz, Harald: *See*—
Muller, Heinz; Lohmar, Elmar; and Scholz, Harald, 4,678,482, Cl. 55-71.000.

Schomers, Josef; Erbele, Kurt; and Bonk, Wernfried, to ANT Nachrichtentechnik GmbH. Assembly system for communications device having plug-in circuit boards connected in multiple stages. 4,679,121, Cl. 361-413.000.

Schroder, Johann: *See*—
Comberg, Albert A.; and Schroder, Johann, 4,678,961, Cl. 313-36.000.

Schroeder, James L., III: *See*—
Farrar, John C.; Ney, Reuben E.; and Schroeder, James L., III, 4,679,013, Cl. 333-182.000.

Schroeder, Royce E., to OFI Testing Equipment Inc. Roller oven for testing fluids. 4,677,843, Cl. 73-54.000.

Schropp, Leopold: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
Enkner, Bernhard; Stephani, Dietmar; Schropp, Leopold; and Stastny, Wilhelm, 4,678,419, Cl. 425-143.000.

Schulte, Heinz; and Mucheyer, Norbert, to Mannesmann Rexroth GmbH. Apparatus for controlling an adjustable member. 4,677,899, Cl. 91-403.000.

Schultz, Gary R., to Eaton Corporation. Wheel end valve for central tire inflation system. 4,678,017, Cl. 152-416.000.

Schulz, Guenter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. O-substituted 3-oxypridinium salts, their preparation and their use as fungicides for crop protection. 4,678,504, Cl. 71-94.000.

Schumaker, Richard E.: *See*—
Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Rigsbee, Everett O., III; and Teener, Michael D., 4,679,191, Cl. 370-84.000.

Schuster, Wilhelm, to Allstar Verbrauchsguter GmbH. Exhauster nozzle. 4,677,705, Cl. 15-398.000.

Schutz, Hans U.: *See*—
Back, Gerhard; Schutz, Hans U.; and Schlesinger, Ulrich, 4,678,851, Cl. 534-619.000.

Schwaighofer, Helmut: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.

Schwarz, Jakob: *See*—
Brandsetter, Robert W.; Schwarz, Jakob; and Seidon, Arnold, 4,679,048, Cl. 342-61.000.

Schweikert, Willi: *See*—
Rohner, Gerhard; Schweikert, Willi; and Ticks, Gerd-Heinz, 4,678,203, Cl. 280-707.000.

Schweinfurter, Friedrich. Regenerative pump with force equalization. 4,678,395, Cl. 415-53.00T.

Schwerdt, Kurt R.; and Levine, Gerald B., to Raytheon Company. Scudo-raster weather display apparatus. 4,678,969, Cl. 315-382.000.

SCM Corporation: *See*—
Curley, Charles M., 4,678,351, Cl. 400-64.000.

Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., to Life Light Systems. Toy light sword. 4,678,450, Cl. 446-405.000.

Scott, Bentley N.; Porter, Vernon R.; and Shortes, Samuel R., to Technology Network International, Inc. Cartridge and target device for markmanship training. 4,678,437, Cl. 434-21.000.

Scott, Julian C.: *See*—
Book, William J.; Scott, Julian C.; and Grace, James A., 4,679,113, Cl. 361-40.000.

Scott, Richard A.; Wortzman, Mitchell S.; and Jungermann, Eric, to Nuetrogena Corporation. Hydroquinone composition having enhanced bio-availability and percutaneous adsorption. 4,678,663, Cl. 424-62.000.

Screen, Stafford T., to Colson Castors (Europe) Limited. Castor brake. 4,677,706, Cl. 16-35.00R.

Scriptel Corporation: *See*—
Kable, Robert G., 4,678,869, Cl. 178-19.000.

Seagate Technology: *See*—
Wevers, William E.; Krause, James N.; and Battu, Ramgopal, 4,679,102, Cl. 360-75.000.

Seaman, Gary G.: *See*—
Anderson, Carl R.; and Seaman, Gary G., 4,678,073, Cl. 198-396.000.

Sears, Roebuck & Co.: *See*—
Gall, John C., 4,678,454, Cl. 474-101.000.

Seaton, David P.: *See*—
Olson, Jeffrey J.; Peck, Stephen R.; and Seaton, David P., 4,679,189, Cl. 370-60.000.

Sebag, Henri: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,678,665, Cl. 424-72.000.

Segal, Ruth; Pisanty, Sara; and Azaz, Emma, to Yissum Research Development Company of the Hebrew University of Jerusalem. Compositions containing glycyrrhizin. 4,678,772, Cl. 514-25.000.

Segawa, Yutaka: *See*—
Kida, Otojiro; and Segawa, Yutaka, 4,678,759, Cl. 501-92.000.

Seidon, Arnold: *See*—
Brandsetter, Robert W.; Schwarz, Jakob; and Seidon, Arnold, 4,679,048, Cl. 342-61.000.

Seikisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Bando, Yoshiaki; Asano, Teruyoshi; Kato, Shigenobu; and Tanioka, Katsuhiko, 4,678,161, Cl. 251-171.000.

Seiko Instruments & Electronics Ltd.: *See*—
Inoue, Yuichi, 4,678,344, Cl. 368-69.000.

Seikosha Co., Ltd.: *See*—
Konno, Tetsuro; Kanai, Yutaka; and Fujita, Tetsuya, 4,678,313, Cl. 355-3.00R.
Shimozono, Shigeru, 4,678,346, Cl. 368-157.000.

Seima Italiana S.p.A.: *See*—
Cossetti, Giuliano, 4,678,258, Cl. 439-571.000.

Sekimoto, Yoshihiro; Terashima, Shigeo; Kumata, Kiyoshi; and Tanaka, Toshiyuki, to Sharp Kabushiki Kaisha. Objective lens drive/-support mechanism in an optical disc player. 4,678,276, Cl. 350-247.000.

Sekiya, Tadashi; Tsuzuki, Akihiro; and Torii, Yasuyoshi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for manufacture of photo-semiconductor. 4,678,732, Cl. 430-136.000.

Selberg, Roberto: *See*—
Kronogard, Hakan; and Selberg, Roberto, 4,678,193, Cl. 273-186.00C.

Selenia Spazio SpA: *See*—
Pedone, Alessandro, 4,678,933, Cl. 307-254.000.

Sellers, Gregory J.: *See*—
Kritchevsky, Gina R.; Gregor, John A.; Gruendig, Manfred W.; Sellers, Gregory J.; and Liss, Barbara, 4,678,699, Cl. 428-175.000.

Senelco Limited: *See*—
Curtis, Stephen P.; and Jordan, Gary V., 4,679,046, Cl. 342-51.000.

Sengoku, Koji: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Sengoku, Koji; and Nagatome, Yoshiaki, 4,678,677, Cl. 426-634.000.

Sensormatic Electronics Corporation: *See*—
Pfaff, Paul H.; Spagna, Richard N.; Clucas, Robert A.; Coulson, Paul; and Eskandry, Ezra D., 4,679,035, Cl. 340-572.000.

Sensors, Inc.: *See*—
Howard, Charles P.; and Stedman, Donald H., 4,678,488, Cl. 55-406.000.

Sepulveda, Domingo: *See*—
Matthews, John A.; Striebel, Edmund E.; Sepulveda, Domingo; and Pane, Francis C., Jr., 4,677,828, Cl. 60-751.000.

Settinger, Manfred: *See*—
Pontius, Klaus; Settinger, Manfred; and Oster, Lothar, 4,678,343, Cl. 366-349.000.

Sewalt, Ronny: *See*—
Allen, Sammy G., 4,678,093, Cl. 215-11.00R.

Shafer, John C., to Baxter Travenol Laboratories, Inc. Sample identification system. 4,678,894, Cl. 235-375.000.

Shanghai Institute of Organic Chemistry, Academia Sinica: *See*—
Zhang, Yun-xiang; Dai, Xing-yi; Lu, Zhi-kang; and Zeng, Sen, 4,678,847, Cl. 526-206.000.

Shanghai Lamp Factory: *See*—
Wang, Ju-Zhen, 4,678,718, Cl. 428-560.000.

Sharon Wire Mill Corporation (Proprietary) Limited: *See*—
Woxholt, Stanley, 4,677,816, Cl. 57-59.000.

Sharp Kabushiki Kaisha: *See*—
Arai, Nobushige, 4,677,966, Cl. 126-450.000.
Fujii, Yoshihal, 4,678,320, Cl. 355-49.000.

Matsui, Sadayoshi; Taneya, Mototaka; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,679,200, Cl. 372-45.000.
Sekimoto, Yoshihiro; Terashima, Shigeo; Kumata, Kiyoshi; and Tanaka, Toshiyuki, 4,678,276, Cl. 350-247.000.

Shaw, Jane M.: *See—*
Hatzakis, Michael; Liutkus, John J.; Paraszczak, Jurij R.; and Shaw, Jane M., 4,678,850, Cl. 526-293.000.

Shaw, Raymond E.: *See—*
Lancaster, Robert L.; and Shaw, Raymond E., 4,678,702, Cl. 428-252.000.

Shedigian, Vandos, to Emhart Industries, Inc. Dielectric fluid for electrical capacitors. 4,679,119, Cl. 361-315.000.

Shell Oil Company: *See—*
King, Bonnie J., 4,678,769, Cl. 502-231.000.

Shenoy, Thirthahalli A.; and Tao, John C., to Air Products and Chemicals, Inc. Natural gas depressurization power recovery and reheat. 4,677,827, Cl. 60-648.000.

Shepard, Kenneth L., to Merck & Co., Inc. Substituted benzenesulfonamides. 4,678,855, Cl. 564-85.000.

Shepard, Richard W.: *See—*
Alling, Richard L.; Shepard, Richard W.; Landrum, Clyde L.; Tofield, Robert H.; and Podhajecki, Stephen T., 4,677,720, Cl. 29-148.40C.

Sherex Chemical Company, Inc.: *See—*
Keys, Robert O., 4,678,561, Cl. 209-166.000.
Keys, Robert O., 4,678,562, Cl. 209-166.000.
Keys, Robert O., 4,678,563, Cl. 209-166.000.

Sherrell, Robert W. D.: *See—*
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.

Sherwin, Gary W., to Westinghouse Electric Corp. Low noise electroencephalographic probe wiring system. 4,678,865, Cl. 174-36.000.

Sherwin, Gary W.; and Zomp, John M., to Westinghouse Electric Corp. Electromagnetically shielded narrow band electroencephalographic amplifier. 4,679,002, Cl. 330-66.000.

Sherwood, Edward P.: *See—*
Hicks, Loy A., Jr.; Sherwood, Edward P.; and Saks, Thomas J., 4,678,253, Cl. 439-210.000.

Shiba, Haruo: *See—*
Okamura, Masatoshi; and Shiba, Haruo, 4,679,109, Cl. 360-132.000.

Shibasaki, Akio; and Iwasaki, Hirofumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Nonwoven sheet having smooth filmy surface layer. 4,678,703, Cl. 428-288.000.

Shibasaki, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Code transmission system character broadcasting receiver. 4,679,082, Cl. 358-147.000.

Shibata, Takanori: *See—*
Tsujii, Fumio; Matsuoka, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, 4,679,147, Cl. 364-449.000.

Shibatani, Juichi: *See—*
Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibatani, Juichi, 4,678,064, Cl. 188-73.450.

Shibuya, Kunihiro: *See—*
Uchida, Kohachi; Shibuya, Kunihiro; and Nakamura, Hajime, 4,678,314, Cl. 355-5.000.

Shieh, Han-Ping D.: *See—*
Kryder, Mark H.; and Shieh, Han-Ping D., 4,679,180, Cl. 369-13.000.

Shifrin, Gordon A.; and Hunsperger, Robert G., to Hughes Aircraft Company. Forming monolithic planar opto-isolators by selective implantation and proton bombardment. 4,677,740, Cl. 29-576.00B.

Shigemasa, Takashi, to Kabushiki Kaisha Toshiba. Dynamic error compensating process controller. 4,679,136, Cl. 364-150.000.

Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium. 4,678,708, Cl. 428-336.000.

Shimanski, Michael A.: *See—*
Palmer, Emery A.; Shimanski, Michael A.; Ellison, Thomas M.; and Everidge, Jack P., 4,678,690, Cl. 428-31.000.

Shimbori, Yuichi: *See—*
Fujita, Masahito; Miyazaki, Makoto; Kizaki, Masami; Nagashima, Yukio; and Shimbori, Yuichi, 4,678,768, Cl. 502-119.000.

Shimizu, Hisashi: *See—*
Itoh, Kunio; Kozakai, Shohei; Hida, Yoshinori; Okinoshima, Hiroshige; Okada, Fumio; Oba, Toshio; Shimizu, Hisashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,678,688, Cl. 427-387.000.

Shimizu, Tasuku: *See—*
Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, 4,678,571, Cl. 210-202.000.

Shimizu, Tsutomu; Tarumoto, Kouji; and Nanba, Satoshi, to Mazda Motor Corporation. Manufacture of a wear-resistant sliding surface. 4,678,738, Cl. 430-320.000.

Shimozono, Shigeru, to Seikosha Co., Ltd. Stepping motor for a clock. 4,678,346, Cl. 368-157.000.

Shimura, Mikihiko: *See—*
Hirano, Masao; Takaoka, Motoaki; and Shimura, Mikihiko, 4,679,157, Cl. 364-557.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Itoh, Kunio; Kozakai, Shohei; Hida, Yoshinori; Okinoshima, Hiroshige; Okada, Fumio; Oba, Toshio; Shimizu, Hisashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,678,688, Cl. 427-387.000.
Itoh, Kunio; Imai, Kiyoshi; Yoshida, Takeo; and Fukushima, Motoo, 4,678,827, Cl. 524-188.000.
Nakamura, Tsutomu; and Imai, Kiyoshi, 4,678,828, Cl. 524-265.000.
Tawara, Yoshio; and Ohashi, Ken, 4,678,634, Cl. 419-30.000.

Shinohara, Hiroo; and Imai, Toshiaki, to Kabushiki Kaisha Toshiba. Automatic chemical analyzer. 4,678,755, Cl. 436-43.000.

Shinohara, Katsufumi: *See—*
Saeki, Osamu; Mori, Kenji; Onoda, Mamoru; Watanabe, Ryo; Shinohara, Katsufumi; Ashie, Takehiko; and Imanishi, Nobuyuki, 4,678,508, Cl. 75-26.000.

Shinohara, Yoshitsugu: *See—*
Tateisi, Kazuma; and Shinohara, Yoshitsugu, 4,678,895, Cl. 235-379.000.

Shinozaki, Masatoshi; Matsumoto, Yoshihiro; Aoyagi, Yoshiki; and Kojima, Kazuhisa, to Kawasaki Steel Corporation. Vibration damping composite laminate. 4,678,707, Cl. 428-323.000.

Shintani, Yooichi: *See—*
Gotou, Shizuo; Kagimasa, Toyohiko; Yoshizumi, Seiichi; and Shintani, Yooichi, 4,679,140, Cl. 364-200.000.

Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, to Nihon Tokushu Noyaku Seizo K.K. 1-pyridylmethyl-2-nitromethylene-1,3-diazacycloalrane insecticides. 4,678,795, Cl. 514-341.000.

Shiomi, Yasuhumi: *See—*
Tanaka, Toshihide; Saka, Hiroshi; Yoshimura, Yoshikazu; and Shiomi, Yasuhumi, 4,679,249, Cl. 455-328.000.

Shiozawa, Etuo; Harada, Shigeo; Ohtsuka, Shuichi; and Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Rotatable head type electrophotographic apparatus, corona charging rotatable head and moveable electrophotographic liquid development processing unit therefor. 4,678,312, Cl. 355-3.00R.

Shirai, Hiroshi: *See—*
Tsujii, Fumio; Matsuoka, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, 4,679,147, Cl. 364-449.000.

Shiratsuchi, Masami; Kawamura, Kiyoshi; Akashi, Toshihiro; Ishihama, Hiroshi; and Uchida, Yasumi, to Kowa Company, Ltd. Optical isomers, processes for production thereof and pharmaceutical composition thereof. 4,678,803, Cl. 514-456.000.

Shirey, Phillip G.; Rowe, David W.; and Waynick, William R., to Paul Mueller Company. Dual-walled coiled plate heat exchanger with vented interface. 4,678,027, Cl. 165-70.000.

Shirk, Raymond A.: *See—*
Belke, Robert E., Jr.; Shirk, Raymond A.; Lin, Hsiu H.; and Zakraysek, Louis, 4,679,122, Cl. 361-414.000.

Shockey, David R.: *See—*
Rapkin, Myron C.; Schoengold, Ronald J.; Shockey, David R.; and Van Rysselberghe, Pierre C., 4,678,757, Cl. 436-169.000.

Sholtz, Paul N.: *See—*
Bantz, David F.; Malaby, Davey L.; and Sholtz, Paul N., 4,679,038, Cl. 340-721.000.

Shone, Michael F.; and Loiacono, Gabriel M., to North American Philips Corporation. Solid-state tunable laser. 4,679,198, Cl. 372-41.000.

Shortes, Samuel R.: *See—*
Scott, Bentley N.; Porter, Vernon R.; and Shortes, Samuel R., 4,678,437, Cl. 434-21.000.

Shortt, Alexandra B.; and Haag, William G., to Stauffer Chemical Company. Trithiophosphonate insecticides. 4,678,778, Cl. 514-141.000.

Shortt, William C. Continuous flow centrifugal separation. 4,678,588, Cl. 210-788.000.

Showa Denko K. K.: *See—*
Sakimoto, Seiichiro; Fujita, Kazuo; Yamauchi, Yutaka; and Matsue, Hiroshi, 4,678,710, Cl. 428-407.000.

Shrull, Dale; and Hendricks, Joe W. Single pass fracture planting system. 4,677,922, Cl. 111-52.000.

Shu, Paul, to Mobil Oil Corporation. Polymer and method for permeability profile control under severe reservoir conditions. 4,678,032, Cl. 166-295.000.

Shu, Winston R.: *See—*
Hartman, Kathy J.; and Shu, Winston R., 4,678,036, Cl. 166-273.000.

Shudo, Kazuo: *See—*
Iwano, Hideo; and Shudo, Kazuo, 4,677,755, Cl. 33-503.000.

Shuman, Bernard E., to EEE Corporation. Magnetically secured display apparatus. 4,677,780, Cl. 40-600.000.

Siegel, Todd W.: *See—*
Larson, Eric R.; and Siegel, Todd W., 4,678,749, Cl. 435-183.000.

Siemens Aktiengesellschaft: *See—*
Beier, Helmut, 4,678,878, Cl. 200-148.00A.
Brunn, Klaus, 4,679,218, Cl. 378-101.000.
Brust, Hans-Detlef, 4,678,988, Cl. 324-158.00R.
Bulst, Wolf-Eckhart; Erthel, Mira; and Zibis, Peter, 4,679,014, Cl. 333-195.000.
Fink, Ludwig; and Toussaint, Hans-Norbert, 4,678,265, Cl. 350-96.200.
Mattelin, Antoon; and Paquet, Bert, 4,678,289, Cl. 350-486.000.
Merz, Arthur, 4,679,149, Cl. 364-478.000.
Neubauer, Heinz, 4,677,990, Cl. 128-786.000.
Preuss, Bernhard; and Berndt, Klaus-Gunther, 4,678,873, Cl. 200-18.000.
Rainer, Alois, 4,679,165, Cl. 364-760.000.

Siesta Corporation: *See—*
Owen, Charles B.; Owen, Charles C.; and Lin, Steve, 4,678,014, Cl. 141-67.000.

Sigma Enterprises, Inc.: *See—*
Hagiwara, Takashi, 4,679,143, Cl. 364-412.000.

Signetics Corporation: *See—*
Huijsing, Johan H.; and Dhuyvetter, Timothy A., 4,678,947, Cl. 307-490.000.

Simitchiev, Dilyan L.: *See—*
Stambolov, Lyuben K.; Chaushev, Sotir Y.; and Simitchiev, Dilyan L., 4,678,615, Cl. 261-111.000.

Simmonds Precision: *See—*
Goehner, Robert D.; Glover, Norman I.; and Hensley, Donald G., 4,678,144, Cl. 244-134.00R.

Simon, Lewis A.; and Scarffe, Michael F., to VS Remek Limited; and LJS Practice Management Limited. Measuring instruments for measuring depth of cavities. 4,677,756, Cl. 33-514.000.

Simonton, J. Wayne: *See—*
Mikulas, Martin M., Jr.; Rhodes, Marvin D.; and Simonton, J. Wayne, 4,677,803, Cl. 52-646.000.

Simonton, R. D.; Cattano, John D.; and Mason, Robert K., to Fremont Special Machine Co., Inc. Separator basket preforms for primary cells and methods of forming and inserting same. 4,678,729, Cl. 429-129.000.

Sinar AG Schaffhausen: *See—*
Koch, Carl, 4,678,302, Cl. 354-107.000.

Singer Company, The: *See—*
Yan, Johnson K., 4,679,040, Cl. 340-747.000.

Sioux Steam Cleaner Corporation: *See—*
Finger, John F.; and Lawrenson, Glen A., 4,678,892, Cl. 219-272.000.

Sirasaki, Yuichi: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,678,371, Cl. 405-164.000.

Sivep di Meniconi Giorgio & C.S.a.s.: *See—*
Fusi, Gaetano; and Meniconi, Silvio, 4,677,935, Cl. 118-108.000.

Sjogren, Christer A.; and D'Amico, Carl, to Quipp Incorporated. Signature stacker. 4,678,387, Cl. 414-47.000.

SKF Industrial Trading and Development Company B.V.: *See—*
Gabelli, Antonio, 4,677,854, Cl. 73-794.000.

Skil Corporation: *See—*
Wong, Jun G., 4,678,871, Cl. 200-1.00V.

Skinner, Alan A. Automotive non-pressure cooling system. 4,677,943, Cl. 123-41.270.

Skoutas, James P., to Cherry Semiconductor Corporation. 50% duty cycle relaxation oscillator with latch-up prevention circuit. 4,679,006, Cl. 331-111.000.

Skovajsa, Joseph. Device for ski training. 4,678,183, Cl. 272-97.000.

Slaboszewski, Dale R.: *See—*
Brady, Cathereine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, 4,678,580, Cl. 210-490.000.

Slater, Robert A.: *See—*
Roe, Anthony M.; Coates, William J.; Slater, Robert A.; Breukelman, Stephen P.; and Meakins, George D., 4,678,786, Cl. 514-247.000.

Slavin, Michael: *See—*
Northman, Bradley L.; Slavin, Michael; and West, Donald J., 4,678,006, Cl. 137-596.170.

Sleder, Richard L.: *See—*
Bracht, Jeffrey L.; Heinrich, Martin W.; van Maaren, Richard D.; and Sleder, Richard L., 4,677,940, Cl. 123-2.000.

Sliker, Larry: *See—*
Ryan, James M.; Golden, Sanford S.; and Sliker, Larry, 4,678,229, Cl. 297-68.000.

Sloan-Kettering Institute: *See—*
Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettgen, Herbert F., 4,678,747, Cl. 435-7.000.

Slobodkin, Yefim, to Avery International. Apparatus for constant pressure in line-web crush-scoring. 4,678,457, Cl. 493-355.000.

Slocum, Barclay. Proximal, tibial osteotomy for leveling a tibial plateau. 4,677,973, Cl. 128-92.0VW.

Smith, Anthony P., to Imperial Chemical Industries PLC. Process start-up. 4,677,821, Cl. 60-39.020.

Smith, Daniel J.: *See—*
Gressett, Charles A., Jr.; Page, John F.; Smith, Daniel J.; and Carruthers, John, 4,677,891, Cl. 84-313.000.

Smith, Donald E.; and Haunhorst, Greg A., to Aeroquip Corporation. Helicopter cargo hook. 4,678,219, Cl. 294-82.330.

Smith Kline & French Laboratories Limited: *See—*
Roe, Anthony M.; Coates, William J.; Slater, Robert A.; Breukelman, Stephen P.; and Meakins, George D., 4,678,786, Cl. 514-247.000.

Smith, Merrill M.; and Ferguson, Donald C., to American Biltrite, Inc. Method and apparatus for making a printed and embossed floor covering using a cast wear layer. 4,678,528, Cl. 156-220.000.

Smith, Michael B., to Amoco Corporation. Method and apparatus for completing a plurality of zones in a wellbore. 4,678,037, Cl. 166-299.000.

Smith, Michael L.: *See—*
Luke, Robert R.; Barker, James M.; Smith, Michael L.; Grigar, Larry L.; and Miller, Carl B., 4,678,044, Cl. 175-4.520.

Smith, Randall W.: *See—*
Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., 4,678,752, Cl. 435-291.000.

Smith, Robert B. Night driving dazzle protection system. 4,678,296, Cl. 351-45.000.

Smith, Steven G.: *See—*
Booth, David E.; Smith, Steven G.; and Adams, John L., 4,678,448, Cl. 445-60.000.

SmithKline Diagnostics, Inc.: *See—*
Rapkin, Myron C.; Schoengold, Ronald J.; Shockey, David R.; and Van Rysselberghe, Pierre C., 4,678,757, Cl. 436-169.000.

SMW Schneider & Weisshaupt GmbH: *See—*
Schmid, Herbert; and Hiestand, Karl, 4,677,885, Cl. 82-40.00R.

Snell, Gerald T.: *See—*
Butcher, William T.; Furlong, James J.; Howe, Dwayne E.; Snell, Gerald T.; and Yara, Calvin M., 4,679,117, Cl. 361-181.000.

Snook, Clive: *See—*
Larsen, Eigil; Lien, Eldar; and Snook, Clive, 4,679,178, Cl. 367-157.000.

Snyder, John D.: *See—*
Dolan, Michael J.; Hilbert, Timothy L.; and Snyder, John D., 4,678,483, Cl. 55-97.000.

Socha, Richard F.: *See—*
Chang, Clarence D.; Penick, Joe E.; and Socha, Richard F., 4,678,645, Cl. 422-190.000.

Societe Anonyme REDOUTE CATALOGUE: *See—*
Bonneton, Marc; and Janvier, Dominique, 4,678,390, Cl. 414-282.000.

Societe d'Exploitation des Procedes Marechal (SEPM): *See—*
Le Magourou, Yves, 4,678,254, Cl. 439-139.000.

Societe Industrielle Auer S.A.: *See—*
Henault, Jean-Paul; Drapier, Albert; Grochowski, Guy; and Meslif, Alain, 4,677,939, Cl. 122-17.000.

Soda, Yutaka: *See—*
Imakoshi, Shigeyoshi; Soda, Yutaka; Suyama, Hideo; and Iida, Yasuhiro, 4,679,107, Cl. 360-113.000.

Sok, Brian A.: *See—*
Nickola, Richard A.; Sok, Brian A.; and Agarwal, Shashi B., 4,678,717, Cl. 428-553.000.

Solex Research Corporation of Japan: *See—*
Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, 4,678,646, Cl. 422-245.000.

Solomon, Donald D.: *See—*
McGary, Charles W.; and Solomon, Donald D., 4,678,660, Cl. 424-25.000.

Solvay & Cie. (Societe Anonyme): *See—*
Tytgat, Daniel; and Lefevre, Pierre, 4,678,541, Cl. 156-664.000.

Sommerer, Jurgen; Leipold, Michael; Kainer, Hartmut; and Stein, Hermann, to Didier-Werke AG. Process and device for mounting porous ceramic material. 4,677,731, Cl. 29-526.00R.

Sone, Takanori: *See—*
Hidaka, Hiroyoshi; and Sone, Takanori, 4,678,783, Cl. 514-218.000.

Sonneborn, Hans H.: *See—*
Hempel, Hans D.; Horn, Jurgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ullrich, 4,678,753, Cl. 435-296.000.

Sonoda, Noboru, to Idemitsu Kosan Company Limited. Apparent viscosity measuring apparatus. 4,677,844, Cl. 73-55.000.

Sony Corporation: *See—*
Hayashi, Masatake, 4,678,962, Cl. 313-383.000.
Higashiyama, Mitsuo, 4,679,225, Cl. 379-62.000.
Imakoshi, Shigeyoshi; Soda, Yutaka; Suyama, Hideo; and Iida, Yasuhiro, 4,679,107, Cl. 360-113.000.
Kikuchi, Masafumi; Onodera, Toshio; Toyama, Sumio; and Sakamoto, Hiroshi, 4,679,091, Cl. 358-242.000.
Murakami, Yoshikazu; Ito, Seigo; Okamoto, Hiromi; and Tanaka, Hideo, 4,679,015, Cl. 333-219.000.
Nemoto, Tsuneo, 4,678,138, Cl. 242-198.000.
Ohuchi, Norikazu, 4,678,537, Cl. 156-643.000.
Okada, Takashi; Mogi, Takao; Kobayashi, Hiroyuki; and Ohi, Katsuyuki, 4,679,235, Cl. 380-20.000.
Tatami, Mitsushige, 4,679,005, Cl. 331-16.000.

Sood, Ajay; and Marra, Robert A., to Aluminum Company of America. Production of high purity substantially spherical metal hydroxide/oxide particles from the hydrolysis of a metal alkoxide aerosol using metal hydroxide/oxide seed nuclei. 4,678,657, Cl. 423-600.000.

Sorimachi, Kanehiro; and Tamari, Makoto, to Canon Kabushiki Kaisha. Sheet manipulating apparatus. 4,677,778, Cl. 40-476.000.

Sorrow, Billy B., to North American Philips Corporation. Hermetically sealed metal film resistor. 4,678,890, Cl. 219-121.00L.

Sottini, Stefano: *See—*
Russo, Vera; Sottini, Stefano; Righini, Giancarlo; and Trigari, Silvana, 4,678,268, Cl. 350-96.180.

Southwest Research Institute: *See—*
Bronstad, Maurice E.; Hatton, James H., Jr.; and Meczkowski, Leonard C., 4,678,166, Cl. 256-13.100.

SpaceLabs Inc.: *See—*
Choksi, Pradip V., 4,677,987, Cl. 128-719.000.

Spacesaver Corporation: *See—*
Murray, William P., 4,678,981, Cl. 320-2.000.

Spagna, Richard N.: *See—*
Pfaff, Paul H.; Spagna, Richard N.; Clucas, Robert A.; Coulson, Paul; and Eskandry, Ezra D., 4,679,035, Cl. 340-572.000.

Spano, John D., to Personal Products Company. Method and apparatus for placing flexible web pieces into concave shaped shells. 4,677,810, Cl. 53-428.000.

Sparacio, Frank J.: *See—*
Pomerene, James H.; Puzak, Thomas R.; Rechtschaffen, Rudolph N.; Rosenfeld, Philip L.; and Sparacio, Frank J., 4,679,141, Cl. 364-200.000.

Sparling, Kenneth P.; Richardson, David G.; Incardona, Angelo; Wood, Ronald E.; Kikendall, Garth D.; and Bakow, Leon, to Lockheed Corporation. Controlled expansion blind fastener design. 4,678,384, Cl. 411-43.000.

Spector, George: *See—*
Finley, Martha N.; and Spector, George, 4,678,485, Cl. 55-255.000.
Lubet, Carl; and Spector, George, 4,677,765, Cl. 36-1.500.
Mills, Sean R.; and Spector, George, 4,678,191, Cl. 273-146.000.

Spectra-Physics, Inc.: *See—*
Lonsdale, Randall J.; and Hellekson, Ronald A., 4,678,288, Cl. 350-432.000.

Speidel, Hans, to Montanwerke Walter GmbH. Clamping or chucking system for a grinding wheel or disk. 4,677,792, Cl. 51-168.000.

Spellar, Peter C.: *See—*
Pillis, Joseph W.; Murphy, David A.; Spellar, Peter C.; and Nemit, Paul, Jr., 4,678,406, Cl. 417-310.000.

Sperry Corporation: *See—*
Goldman, Winston W., 4,678,970, Cl. 315-397.000.
Henze, Christopher P., 4,678,984, Cl. 323-285.000.
Nielsen, Max E.; Labrum, Joseph H.; and Grant, Patrick S., 4,679,215, Cl. 377-95.000.

Spielmaker, Richard: *See—*
Reese, George; Spielmaker, Richard; and Schatz, Douglas, 4,679,007, Cl. 333-17.00M.

Spofa, Spojene Podniky Pro Zdravotnickou Vyrobu: *See—*
Protiva, Miroslav; Jilek, Jiri; Cervena, Irena; Dlabac, Antonin; Valchar, Martin; and Pomykacek, Josef, 4,678,788, Cl. 514-254.000.

Spotzl, Markus: *See—*
Pongratz, Leonhard; Kotai, Ferenc; and Spotzl, Markus, 4,677,894, Cl. 86-45.000.

Sprinkel, Francis M., Jr.: *See—*
Kallianos, Andrew G.; Sprinkel, Francis M., Jr.; and Decker, Paula, 4,677,995, Cl. 131-335.000.

Sramek, Bohumir, to Bomed Medical Manufacturing, Ltd. Calibrated arterial pressure measurement device. 4,677,984, Cl. 128-681.000.

Sridhar, Narasi; and Crook, Paul, to Cabot Corporation. Corrosion- and wear-resistant duplex steel. 4,678,523, Cl. 148-325.000.

Staar Development Company S.A.: *See—*
Staar, Marcel, 4,679,183, Cl. 369-84.000.

Staar, Marcel, to Staar Development Company S.A. Sound recording apparatus for blank films and tapes. 4,679,183, Cl. 369-84.000.

Stahl, Henrik O.; and Rostrup-Nielsen, Jens R. Heat exchange reforming process and reactor. 4,678,600, Cl. 252-373.000.

Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Friction roller for open-end friction spinning. 4,677,815, Cl. 57-401.000.

Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Method and apparatus for operating an open-end friction spinning machine. 4,677,819, Cl. 57-264.000.

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Suction control arrangement for open-end friction spinning. 4,677,820, Cl. 57-401.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,677,815, Cl. 57-401.000.
Stahlecker, Fritz, 4,677,819, Cl. 57-264.000.
Stahlecker, Fritz, 4,677,820, Cl. 57-401.000.

Stambolov, Lyuben K.; Chaushev, Sotir Y.; and Simitchiev, Dilyan L., to DSPIE "D. Blagoev". Cooling stack for cooling towers. 4,678,615, Cl. 261-111.000.

Standard Telephones and Cables plc: *See—*
Davis, Aurthur A.; and Eady, Robert W., 4,679,250, Cl. 455-601.000.

Standard Telephones and Cables Public Limited Co.: *See—*
Gunn, Duncan A.; Crownshaw, John C.; Davis, Arthur A.; and Colegate, Gilbert W. P., 4,678,270, Cl. 350-96.200.

Staniulis, Mark T.: *See—*
Chiang, Robert L.; and Staniulis, Mark T., 4,678,765, Cl. 502-65.000.

Stant Inc.: *See—*
Crute, Billy G., 4,678,097, Cl. 220-288.000.

Stanton, James L.; and Ksander, Gary M., to Ciba-Geigy Corporation. Gamma-r-glutamoyl derivatives. 4,678,800, Cl. 514-412.000.

Stanton and Staveley Limited: *See—*
Bateman, Terence; and Stevens, William W., 4,678,211, Cl. 285-368.000.

Staple, Bruce: *See—*
Richardson, Charles P.; Kuhl, Virgil; Gasparaitis, Bernard; Staple, Bruce; and Krieg, Larry M., 4,679,233, Cl. 379-433.000.

Stastny, Wilhelm: *See—*
Enkner, Bernhard; Stephani, Dietmar; Schropp, Leopold; and Stastny, Wilhelm, 4,678,419, Cl. 425-143.000.

Staszel, Lawrence E.: *See—*
Vrabel, Robert J.; Vajgart, Jeffery L.; Staszel, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.

Statz, Robert G. Bearing assembly. 4,678,350, Cl. 384-208.000.

Stauber, Bernard. Transfer nozzle in a hot runner tool. 4,678,426, Cl. 425-549.000.

Staudinger, Hermann, to Konrad Rosenbauer KG. Fire fighting service vehicle. 4,678,041, Cl. 169-24.000.

Stauffer Chemical Company: *See—*
Bolzan, Louis F.; and Weil, Edward D., 4,678,612, Cl. 260-543.00R.
Olego, Diego J., 4,678,266, Cl. 350-96.120.
Shortt, Alexandra B.; and Haag, William G., 4,678,778, Cl. 514-141.000.

Stauffer-Wacker Silicones Corporation: *See—*
Hoffman, Michael J., 4,678,815, Cl. 523-122.000.

STC, plc: *See—*
Drake, Cyril F.; and Brocklehurst, John R., 4,678,659, Cl. 424-451.000.

Stedman, Donald H.: *See—*
Howard, Charles P.; and Stedman, Donald H., 4,678,488, Cl. 55-406.000.

Stegemann, Joachim: *See—*
Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,678,543, Cl. 202-154.000.

Stein, Hermann: *See—*
Sommerer, Jurgen; Leipold, Michael; Kainer, Hartmut; and Stein, Hermann, 4,677,731, Cl. 29-526.00R.

Stein, Werner; and Muller, Walter, to Transformatoren Union Aktiengesellschaft. Circuit arrangement for large power transformers. 4,678,927, Cl. 307-104.000.

Stein, Willy, to Stein, Willy. Arrangement for influencing the keeping of a driving direction by a motor vehicle. 4,678,197, Cl. 280-80.00R.

Steinkamper, Reinhard; Boll, Wolf; and Peitsmeier, Karl, to Daimler-Benz Aktiengesellschaft. Shaft connection arrangement. 4,678,361, Cl. 403-359.000.

Stelter, Norbert: *See—*
Beeck, Peter op de; Wuest, Rainer; and Stelter, Norbert, 4,679,145, Cl. 364-424.100.

Stendel, Wilhelm: *See—*
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hanssler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.
Maurer, Fritz; Homeyer, Bernard; and Stendel, Wilhelm, 4,678,776, Cl. 514-89.000.

Stepan Company: *See—*
Green, Harold A.; and Weinstein, Morris, 4,678,515, Cl. 106-111.000.

Stephani, Dietmar: *See—*
Enkner, Bernhard; Stephani, Dietmar; Schropp, Leopold; and Stastny, Wilhelm, 4,678,419, Cl. 425-143.000.

Stephen, James C.: *See—*
Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, 4,677,964, Cl. 126-41.00R.

Sterner, Carl L. Pothole patcher and road surfacing device. 4,678,363, Cl. 404-75.000.

Stevens, William W.: *See—*
Bateman, Terence; and Stevens, William W., 4,678,211, Cl. 285-368.000.

Steyr-Daimler-Puch AG: *See—*
Malhotra, Satish K., 4,677,898, Cl. 89-187.010.
Visek, Tomas; Czaby, Gottfried; and Nowotny, Georg, 4,677,952, Cl. 123-372.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Friedrich, Karl, 4,677,874, Cl. 74-665.0GC.

Sticher, Otto: *See—*
Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.

Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., to Austoft Industries Limited. Cane harvester. 4,677,813, Cl. 56-13.900.

Stocco, Peter J.: *See—*
Mishler, Ralph E.; and Stocco, Peter J., 4,679,017, Cl. 335-164.000.

Stole, Kjell A.; Lovsland, Arnstien; and Havig, Egil, to Norton Company. Screening device and process. 4,678,560, Cl. 209-23.000.

Stormo, Keith E.: *See—*
Oberlander, George H.; and Stormo, Keith E., 4,678,025, Cl. 165-12.000.

Stout, Daniel M.: *See—*
Putter, Irving; and Stout, Daniel M., 4,678,774, Cl. 514-30.000.

Stratton, Richard D.: *See—*
Perry, David A.; and Stratton, Richard D., 4,678,532, Cl. 156-314.000.

Straus, Albert E. Roll edge protector. 4,677,728, Cl. 29-415.000.

Strauss, John W. High pressure revolving sewer cleaning nozzle. 4,677,997, Cl. 134-167.00C.

Street Specialty Products Inc.: *See—*
Streett, James T., 4,677,708, Cl. 16-334.000.

Streett, James T., to Street Specialty Products Inc. Replacement spring for a corvette door hinge. 4,677,708, Cl. 16-334.000.

Striebel, Edmund E.: *See—*
Matthews, John A.; Striebel, Edmund E.; Sepulveda, Domingo; and Pane, Francis C., Jr., 4,677,828, Cl. 60-751.000.

Stromberg, Nicklas: *See—*
Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettgen, Herbert F., 4,678,747, Cl. 435-7.000.

Stuckey, William C. Integrated liquid distribution apparatus. 4,678,341, Cl. 366-142.000.

Stueer, Heinrich: *See—*
Duerrschnabel, Wolfgang; Puckert, Franz; Stueer, Heinrich; and Bletschacher, Max, 4,678,637, Cl. 420-490.000.

Su, Cheng-Chung. Lavatory hospital bed. 4,677,700, Cl. 5-90.000.

Such, Christian: *See—*
Belluteau, Jean-Pierre; Bocard, Christian; Such, Christian; and Vaillant, Daniel, 4,678,558, Cl. 208-390.000.

Suda, Shigeyuki: *See—*
Baba, Takeshi; and Suda, Shigeyuki, 4,678,899, Cl. 230-201.000.

Suddeutsche Kuhlerfabrik Julius Fr Behr GmbH & Co.: *See—*
Lenz, Werner; and Most, Manfred, 4,678,026, Cl. 165-67.000.

Sueda, Tetsuo: *See—*
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,678,733, Cl. 430-57.000.

Sugano, Takuo; Okabe, Yoichi; Miyake, Hideharu; and Fukaya, Naoki, to University of Tokyo. Unidirectional single-flux-quantum logic circuit. 4,678,945, Cl. 307-476.000.

Sugawara, Norio: *See*—
Natsumeda, Takeshi; Nawa, Motoyuki; and Sugawara, Norio, 4,677,904, Cl. 98-38.100.

Sugawara, Yutaka: *See*—
Usami, Hiroko; Yamamoto, Akihiro; Sugawara, Yutaka; Kotani, Shozo; and Kato, Keijiro, 4,678,773, Cl. 514-25.000.

Sugie, Toshinori: *See*—
Kawabata, Juheiji; Sugie, Toshinori; Kobata, Fumihiro; and Hirayama, Akira, 4,678,831, Cl. 524-496.000.

Sugimori, Mutsuyuki: *See*—
Llinas, Rodolfo R.; Sugimori, Mutsuyuki; and Crank, Ronald K., 4,677,982, Cl. 128-664.000.

Sugimoto, Shigeyuki; Kato, Masayuki; and Chonan, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Power failure stop circuit for a converter. 4,678,980, Cl. 318-759.000.

Sugino, Takashi: *See*—
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Sugisawa, Ko; Matsumura, Yasushi; Sengoku, Koji; and Nagatome, Yoshiaki, to House Food Industrial Company Limited. Process for preparing tofu charged into a container. 4,678,677, Cl. 426-634.000.

Sugishima, Kenji; and Nakagawa, Kenji, to Fujitsu Limited. Electron beam exposure method and apparatus. 4,678,919, Cl. 250-491.100.

Sugiura, Susumu; Sugino, Takashi; and Hirose, Naoya, to Canon Kabushiki Kaisha. Color image processing apparatus with a plurality of addressable characteristic conversion tables for compensating for differences in the spectral characteristics of different input devices. 4,679,074, Cl. 358-80.000.

Sugiura, Toshihiro: *See*—
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Sulzer Canada, Inc.: *See*—
Wynn, Nicholas P., 4,678,648, Cl. 423-228.000.

Sumihi, Noritaka, to Kabushiki Kaisha Daikin Seisakusho. Power change-over mechanism of a vehicle for industrial machinery. 4,677,867, Cl. 74-332.000.

Sumikawa, Seiji; and Noguchi, Ichiro, to Diesel Kiki Co., Ltd. Air conditioning system for automotive vehicles. 4,677,830, Cl. 62-126.000.

Sumitomo Bakelite Company Limited: *See*—
Kawashima, Giichi, 4,678,616, Cl. 264-24.000.

Sumitomo Electric Industries, Ltd.: *See*—
Nakagawa, Mitsuhiko; and Nitto, Fumiaki, 4,678,818, Cl. 523-157.000.
Tada, Koji; Tatsumi, Masami; Kotani, Toshihiro; and Sawada, Shinichi, 4,678,534, Cl. 156-607.000.
Yoshida, Noriyuki; and Takahashi, Kenichi, 4,678,327, Cl. 356-73.100.

Sumitomo Heavy Industries, Ltd.: *See*—
Saitoh, Hajime; and Maeda, Morio, 4,678,883, Cl. 219-10.61R.

Sumitomo Special Metal Co. Ltd.: *See*—
Miyamoto, Toshinobu; Hayashi, Hiroo; Sakurai, Hideya; Takabayashi, Hirofumi; and Ohnishi, Youichi, 4,679,022, Cl. 335-296.000.

Sumka, Elmer H., to Westinghouse Electric Corp. Elevator car. 4,678,062, Cl. 187-1.00R.

Sumoto, Kunihiro: *See*—
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.

Sun Industrial Coatings Private Ltd.: *See*—
Tee, Sim Ah, 4,677,937, Cl. 118-500.000.

Sun Microsystems, Inc.: *See*—
Fetter, John L.; Evans, Jerald R.; and Ergene, Serdar, 4,679,041, Cl. 340-747.000.

Sunday, Lester R., to Westinghouse Electric Corp. Apparatus for machining a valve's seat. 4,678,379, Cl. 408-83.500.

Sundberg, Kenneth R.; and Patton, Keith H., to Phillips Petroleum. Method of collecting and processing spectral data for the earth's surface. 4,678,911, Cl. 250-253.000.

Superior Manufacturing & Instrument Corporation: *See*—
Moscovici, Poldi, 4,679,130, Cl. 363-17.000.
Moscovici, Poldi, 4,679,133, Cl. 363-46.000.

Suprise, Jody D.: *See*—
Van Gompel, Paul T.; and Suprise, Jody D., 4,677,695, Cl. 2-79.000.

Surface Systems, Inc.: *See*—
Whitener, Miles B., 4,679,160, Cl. 364-563.000.

Surgeaco, Inc.: *See*—
Ayres, Walter D., Jr., 4,678,589, Cl. 210-797.000.

Surgical Dynamics, Incorporated: *See*—
Onik, Gary; and Ginsburg, Leonard, 4,678,459, Cl. 604-22.000.

Survival Technology, Inc.: *See*—
Mesa, Clarence M., 4,678,461, Cl. 604-157.000.

Sutherland, Ivan E. Asynchronous queue system. 4,679,213, Cl. 377-66.000.

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Sutka, Pal; and Sutka, Klara, 4,678,748, Cl. 435-68.000.

Sutka, Pal; and Sutka, Klara. Process for the production of immunobiological preparations applicable in the diagnosis, prevention and/or treatment of *Candida guilliermondii* infections. 4,678,748, Cl. 435-68.000.

Suyama, Hideo: *See*—
Imakoshi, Shigeyoshi; Soda, Yutaka; Suyama, Hideo; and Iida, Yasuhiro, 4,679,107, Cl. 360-113.000.

Suzuki, Kiminobu: *See*—
Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, 4,678,934, Cl. 307-279.000.

Suzuki, Norio; Watabe, Akira; and Yamashita, Kazunari, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine. 4,677,959, Cl. 123-587.000.

Suzuki, Shizuo: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,678,371, Cl. 405-164.000.

Suzuki, Tsunemasa: *See*—
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.

Suzuki, Tsutomu, to Mitsubishi Jukogyo Kabushiki Kaisha. Automatic cutting and winding apparatus for a web-like material such as a film. 4,678,133, Cl. 242-56.00A.

Suzuki, Yoshio; and Yamaguchi, Seiji, to Jidosha Kiki Co., Ltd. Power steering apparatus. 4,678,052, Cl. 180-143.000.

Suzuki, Yukio: *See*—
Uragami, Akira; Suzuki, Yukio; Kadono, Shinji; Iwamura, Masahiro; Masuda, Ikuro; and Yamauchi, Tatsumi, 4,678,943, Cl. 307-473.000.

Svenska Rotor Maskiner Aktiebolag: *See*—
Fetzer, Wolfgang, 4,678,643, Cl. 422-175.000.

Swiss Aluminium Ltd.: *See*—
Ritzl, Antal; and Zehnder, Jurg, 4,678,225, Cl. 296-181.000.

Swiss Aluminum Ltd.: *See*—
Kampfer, Konrad; Rieger, Wolfhart; Gauckler, Ludwig; and Dellapina, Marco, 4,678,758, Cl. 501-80.000.

Sydo, Lukas: *See*—
Butts, Gary; Sydo, Lukas; and Rossi, Victor L., 4,678,347, Cl. 384-43.000.

Sykes, Donald J., to Marpac Industries, Inc. Method for converting an expended thermoplastic article into a useful article. 4,678,617, Cl. 264-25.000.

Synchro-Start Products, Inc.: *See*—
Mishler, Ralph E.; and Stocco, Peter J., 4,679,017, Cl. 335-164.000.

Syntex (U.S.A.) Inc.: *See*—
Kluge, Arthur F.; and Wu, Helen Y., 4,678,805, Cl. 514-510.000.

Systems Engineering & Manufacturing Corp.: *See*—
Fishman, Herbert; and Rogers, Alvin J., 4,678,169, Cl. 269-46.000.

Szabados, Andreas. Test specimen container for pasty specimen material. 4,678,559, Cl. 209-17.000.

T-Bar Incorporated: *See*—
Young, William K., 4,679,123, Cl. 361-428.000.

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Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.

Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihiro; and Makishima, Tokuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for producing a catalyst component for polymerization of olefins. 4,678,767, Cl. 502-104.000.

Tada, Koji; Tatsumi, Masami; Kotani, Toshihiro; and Sawada, Shinichi, to Sumitomo Electric Industries, Ltd. Method for growing a single crystal. 4,678,534, Cl. 156-607.000.

Taguchi, Yoshinori; and Yamanami, Tsuguya, to Wacom Co., Ltd. Position detecting device. 4,678,870, Cl. 178-19.000.

Taiyo Yushi K.K.: *See*—
Ishizuka, Waichi; and Aoki, Ryoichi, 4,678,676, Cl. 426-573.000.

Tajima, Osamu: *See*—
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Takabayashi, Hirofumi: *See*—
Miyamoto, Toshinobu; Hayashi, Hiroo; Sakurai, Hideya; Takabayashi, Hirofumi; and Ohnishi, Youichi, 4,679,022, Cl. 335-296.000.

Takagi, Yasuo: *See*—
Yamamori, Takahiro; Takagi, Yasuo; and Furukawa, Junichi, 4,677,878, Cl. 74-861.000.

Takahama, Shinobu, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing package for high power integrated circuit. 4,677,741, Cl. 29-588.000.

Takahara, Atsushi; Ishikawa, Tomoyoshi; Tanaka, Hiroyuki; and Okui, Tamio, to NEC Corporation. Frequency synthesizer of a phase-locked type with a sampling circuit. 4,679,004, Cl. 331-14.000.

Takahashi, Kenichi: *See*—
Yoshida, Noriyuki; and Takahashi, Kenichi, 4,678,327, Cl. 356-73.100.

Takahashi, Shohzoh: *See*—
Yoshimura, Susumu; Kudoh, Yasuo; Tsuchiya, Soji; Kojima, Toshikuni; and Takahashi, Shohzoh, 4,679,124, Cl. 361-433.000.

Takahashi, Yoshinobu: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,678,644, Cl. 422-186.050.

Takaku, Tetsuo: *See*—
Katsurai, Junji; Monma, Masao; and Takaku, Tetsuo, 4,679,053, Cl. 346-1.100.

Takamatsu, Hideo: *See*—
Yoshizawa, Tamae; Otsuka, Kiyoto; Nagata, Shiro; and Takamatsu, Hideo, 4,678,841, Cl. 525-353.000.
Takamatsu, Masayoshi; Hashimoto, Kouji; Manabe, Akiyoshi; and Ichihana, Hideyuki, to Teijin Chemicals, Ltd. Mixed polycarbonate resin composition. 4,678,845, Cl. 525-462.000.
Takano, Hiroshi: *See*—
Nakao, Shinroku; Itoh, Masao; Itoh, Akira; and Takano, Hiroshi, 4,678,182, Cl. 272-73.000.
Takao, Mitsunori, to Nippondenso Co., Ltd. Method and apparatus for discriminating operativeness/inoperativeness of an air-fuel ratio sensor. 4,677,955, Cl. 123-489.000.
Takaoka, Motoaki: *See*—
Hirano, Masao; Takaoka, Motoaki; .and Shimura, Mikihiko, 4,679,157, Cl. 364-557.000.
Takasago Perfumery Co., Ltd.: *See*—
Ishii, Hiroshi; and Hosoda, Bunichiro, 4,678,603, Cl. 252-522.00R.
Takase, Iwao: *See*—
Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.
Takase, Tsuneyoshi: *See*—
Fujinuma, Katsumi; Takase, Tsuneyoshi; and Hayashi, Yoriyuki, 4,677,976, Cl. 128-201.250.
Takayama, Makoto, to Canon Kabushiki Kaisha. Color adjusting device. 4,679,072, Cl. 358-80.000.
Takayasu, Hidekazu: *See*—
Nishimura, Seiichi; and Takayasu, Hidekazu, 4,677,944, Cl. 123-73.00B.
Takeda, Tamio; Gokyu, Toshio; Mizutani, Yuji; and Nakashima, Jun, to Kabushiki Kaisha Toshiba. Rotor with permanent magnets having thermal expansion gaps. 4,678,954, Cl. 310-156.000.
Takemae, Yoshihiro, to Fujitsu Limited. Shift register for refreshing a MIS dynamic memory. 4,679,214, Cl. 377-80.000.
Takemasa, Masami, to Diesel Kiki Co., Ltd. Deodorizing device of an air conditioning system for automotive vehicles. 4,677,902, Cl. 98-2.110.
Takeuchi, Kunihiko: *See*—
Miller, Charles H.; Takeuchi, Kunihiko; and Goodridge, Paul A., 4,678,490, Cl. 65-14.000.
Takeuchi, Masashi: *See*—
Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.
Takeuchi, Masasi: *See*—
Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masasi; and Tsukase, Masaaki, 4,678,735, Cl. 430-203.000.
Takeuchi, Siro: *See*—
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Takiguchi, Haruhisa: *See*—
Matsui, Sadayoshi; Taneya, Mototaka; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,679,200, Cl. 372-45.000.
Taleyarkhan, Rusi P., to Westinghouse Electric Corp. Boiling water nuclear reactor fuel assembly. 4,678,631, Cl. 376-444.000.
Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Abe, Hisamasa, to Fuji Photo Film Co., Ltd. Photographic printing paper support. 4,678,742, Cl. 430-523.000.
Tamagne, Henry J., to Ford Motor Company. Apparatus for positioning two sensor devices. 4,677,946, Cl. 123-146.50A.
Tamamori, Hideo; and Ikeda, Mitsuhiro, to Nippon Air Brake Co., Ltd. Equalizer discharge valve for a railroad car air brake system. 4,678,241, Cl. 303-33.000.
Tamari, Makoto: *See*—
Sorimachi, Kanehiro; and Tamari, Makoto, 4,677,778, Cl. 40-476.000.
Tamaru, Takuya: *See*—
Kamoshita, Yasuhiko; Tamaru, Takuya; Ogusu, Mikio; and Urata, Kazuo, 4,679,182, Cl. 369-77.200.
Tamenori, Hiroyuki; Hattori, Akihiko; and Yoshiyagawa, Mitsugi, to Nippon Sheet Glass Co., Ltd. Process for producing silica in fine powder form. 4,678,652, Cl. 423-339.000.
Tamer Corporation: *See*—
Barton, James W.; and Allen, Hubert D., 4,678,042, Cl. 172-15.000.
Tamura, Kaoru; Yasuhiro, Kawai; and Utsumi, Isao, to Fuji Photo Film Co., Ltd. Selective sheet feeder. 4,678.180, Cl. 271-296.000.
Tamura, Kozo: *See*—
Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, 4,678,571, Cl. 210-202.000.
Tanabe, Masatoshi: *See*—
Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, 4,678,571, Cl. 210-202.000.
Tanaka, Eiichi; Furumai, Koro; and Kikutani, Fumitaka, to Matsushita Electric Industrial Co., Ltd. Multistage fuel burner having a helically rising column of air-fuel mixture. 4,678,428, Cl. 431-76.000.
Tanaka, Hideo: *See*—
Murakami, Yoshikazu; Ito, Seigo; Okamoto, Hiromi; and Tanaka, Hideo, 4,679,015, Cl. 333-219.000.
Tanaka, Hiroyuki: *See*—
Takahara, Atsushi; Ishikawa, Tomoyoshi; Tanaka, Hiroyuki; and Okui, Tamio, 4,679,004, Cl. 331-14.000.
Tanaka, Kazumi: *See*—
Nogi, Tatsuo; Iwami, Tomonori; and Tanaka, Kazumi, 4,678,581, Cl. 210-500.230.
Tanaka, Kazunobu; and Mori, Kyozo, to Daicel Chemical Industries, Ltd. Highly conductive styrenic resin composition. 4,678,602, Cl. 252-513.000.
Tanaka, Kunihiko: *See*—
Watanabe, Masaki; Yamamoto, Hitoshi; Matsuoka, Yoshinori; and Tanaka, Kunihiko, 4,678,053, Cl. 180-210.000.
Tanaka, Minoru; and Yonehata, Yuzuru, to Mitsubishi Denki Kabushiki Kaisha. Snubber circuit for GTO thyristor. 4,678,932, Cl. 307-633.000.
Tanaka, Norito, to Toyo Lint Free Co., Ltd. Dust-free garment for clean room. 4,677,696, Cl. 2-84.000.
Tanaka, Satoshi: *See*—
Akiyama, Kazunori; Tsunoda, Arihiro; and Tanaka, Satoshi, 4,678,178, Cl. 271-242.000.
Tanaka, Shigetaka, to Ricoh Company, Ltd. Equalization system tuning device which updates equalizer coefficients based on selected decision regions. 4,679,208, Cl. 375-13.000.
Tanaka, Toshihide; Saka, Hiroshi; Yoshimura, Yoshikazu; and Shiomi, Yasuhumi, to Matsushita Electric Industrial Co., Ltd. Waveguide-to-microstrip line coupling arrangement and a frequency converter having the coupling arrangement. 4,679,249, Cl. 455-328.000.
Tanaka, Toshiyuki: *See*—
Sekimoto, Yoshihiro; Terashima, Shigeo; Kumata, Kiyoshi; and Tanaka, Toshiyuki, 4,678,276, Cl. 350-247.000.
Tandberg Data A/S: *See*—
Dahlerud, Ole C., 4,679,104, Cl. 360-78.000.
Tandy Corporation: *See*—
Berger, Michael F.; and Sawyer, Sammy D., 4,679,166, Cl. 364-900.000.
Taneya, Mototaka: *See*—
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Tanioka, Katsuhiko: *See*—
Bando, Yoshiaki; Asano, Teruyoshi; Kato, Shigenobu; and Tanioka, Katsuhiko, 4,678,161, Cl. 251-171.000.
Taniyama, Kiyoshi; and Hori, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Lubrication mechanism in final drive and differential unit. 4,677,871, Cl. 74-467.000.
Tanno, Masuo: *See*—
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Tao, John C.: *See*—
Shenoy, Thirthahalli A.; and Tao, John C., 4,677,827, Cl. 60-648.000.
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, to Cassella Aktiengesellschaft. Mixtures of blue mono-azo disperse dyestuffs and their use for dyeing polyester. 4,678,476, Cl. 8-639.000.
Tarumoto, Kouji: *See*—
Shimizu, Tsutomu; Tarumoto, Kouji; and Nanba, Satoshi, 4,678,738, Cl. 430-320.000.
Tasch, Franz: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
Tashiro, Yoshizo, to Alps Electric Co., Ltd. Antiflocculating dyent for spacers in liquid crystal displays. 4,678,284, Cl. 350-344.000.
Tatami, Mitsushige, to Sony Corporation. Phase locked loop with frequency offset. 4,679,005, Cl. 331-16.000.
Tate, William J. Automatic mirror rotating system. 4,679,158, Cl. 364-559.000.
Tateisi, Kazuma; and Shinohara, Yoshitsugu, to Omron Tateisi Electronics Co. System for making payments for transactions. 4,678,895, Cl. 235-379.000.
Tatsumi, Masami: *See*—
Tada, Koji; Tatsumi, Masami; Kotani, Toshihiro; and Sawada, Shinichi, 4,678,534, Cl. 156-607.000.
Taube, Bill: *See*—
Grundstedt, Peter; and Taube, Bill, 4,678,018, Cl. 160-135.000.
Tawara, Yoshio; and Ohashi, Ken, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of an anisotropic sintered permanent magnet. 4,678,634, Cl. 419-30.000.
Tayebi, Amad, to Capsule Technology International, Ltd. Method for sealing tamper-evident capsules. 4,677,812, Cl. 53-477.000.
Taylor, Michael D.; and Badger, Edward W., to Warner-Lambert Company. 2-alkylidene derivatives of 1,2,3,4-tetrahydropyridine-2,5-pyridine carboxylic acid dialkyl esters useful for treatment of cardiovascular disorders. 4,678,796, Cl. 514-356.000.
Taylor, Roderick S.; and Leopold, Kurt E., to Canadian Patents and Development Limited. Magnetically induced pulser laser excitation system. 4,679,203, Cl. 372-86.000.
TDK Corporation: *See*—
Ihara, Keiichi, 4,677,745, Cl. 29-741.000.
Kobayashi, Mikiya; Nakada, Takeshi; and Arai, Michio, 4,679,056, Cl. 346-76.0PH.
Okamura, Masatoshi; and Shiba, Haruo, 4,679,109, Cl. 360-132.000.
Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, 4,678,708, Cl. 428-336.000.
Technicon Instruments Corporation: *See*—
Cassaday, Michael M., 4,678,641, Cl. 422-101.000.
Technion Research & Development Foundation, Ltd.: *See*—
Hasson, David; and Karmon, Mordechai, 4,678,685, Cl. 427-235.000.
Technip Geoproduction: *See*—
Cousty, Jean Pierre, 4,678,372, Cl. 405-196.000.
Technology Dynamics, Inc.: *See*—
Saaski, Elric W.; and Hartl, James C., 4,678,904, Cl. 250-227.000.

Technology Network International, Inc.: *See*—
Scott, Bentley N.; Porter, Vernon R.; and Shortes, Samuel R., 4,678,437, Cl. 434-21.000.
Tee, Sim Ah, to Sun Industrial Coatings Private Ltd. Apparatus for holding electrial or electronic components during the application of solder. 4,677,937, Cl. 118-500.000.
Teener, Michael D.: *See*—
Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Rigsbee, Everett O., III; and Teener, Michael D., 4,679,191, Cl. 370-84.000.
Tegal Corporation: *See*—
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Teijin Chemicals, Ltd.: *See*—
Takamatsu, Masayoshi; Hashimoto, Kouji; Manabe, Akiyoshi; and Ichihana, Hideyuki, 4,678,845, Cl. 525-462.000.
Tektronix, Inc.: *See*—
Agoston, Agoston, 4,678,345, Cl. 368-119.000.
Corrie, Brian L.; Benn, Pauline; and McElevey, Michael J., 4,677,737, Cl. 29-571.000.
Telebit Corporation: *See*—
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Telecommunications Radioelectriques et Telephoniques T.R.T: *See*—
Lassaux, Jean; and Dagorn, Christian, 4,679,230, Cl. 379-411.000.
Telefonaktiebolaget L M Ericsson: *See*—
Henriksson, Bengt-Ake, 4,678,109, Cl. 226-74.000.
Temerinac, M.: *See*—
Markovic, A.; Temerinac, M.; and Braegas, Peter, 4,679,238, Cl. 381-16.000.
Terada, Takami: *See*—
Ishida, Keiichi; and Terada, Takami, 4,678,232, Cl. 297-408.000.
Teraoka, Hideyuki, to Dainippon Screen Mfg. Co., Ltd. Heat treatment method. 4,678,432, Cl. 432-12.000.
Terashima, Shigeo: *See*—
Sekimoto, Yoshihiro; Terashima, Shigeo; Kumata, Kiyoshi; and Tanaka, Toshiyuki, 4,678,276, Cl. 350-247.000.
Terragnoli, John. Self-contained machine for simultaneously slicing and perforating muffins prior to packaging. 4,677,888, Cl. 83-862.000.
Terumo Corporation: *See*—
Yamaguchi, Keiji; and Ishizaka, Hideo, 4,677,983, Cl. 128-680.000.
Terumo Kabushiki Kaisha: *See*—
Watanabe, Masaharu; and Ohe, Hiroaki, 4,678,566, Cl. 210-143.000.
Texaco Inc.: *See*—
Dureanleau, Roger G.; and Knifton, John F., 4,678,857, Cl. 568-454.000.
Texas Instruments Incorporated: *See*—
Doering, Robert R.; Duane, Michael P.; and Armstrong, Gregory J., 4,677,739, Cl. 29-576.00B.
Hynecek, Jaroslav, 4,679,212, Cl. 377-58.000.
Malhi, Satwinder D. S., 4,677,735, Cl. 29-571.000.
Tezuka, Nobuo, to Canon Kabushiki Kaisha. Information recording or erasing apparatus. 4,679,101, Cl. 360-60.000.
TH. Goldschmidt AG: *See*—
Fock, Jurgen; and Rott, Hans, 4,678,599, Cl. 252-343.000.
Weitemeyer, Christian; and Jachmann, Jurgen, 4,678,846, Cl. 525-477.000.
The, Paul J.; and Misra, Chanakya, to Aluminum Company of America. Process for lowering level of contaminants in Bayer liquor by membrane filtration. 4,678,477, Cl. 23-305.00A.
Theeuwes, Felix: *See*—
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,678,467, Cl. 604-892.000.
Thery, Denis: *See*—
Schapira, Joseph; Ken, Victor; Thery, Denis; and Jelodin, Stephane, 4,678,519, Cl. 148-6.15Z.
Thibault, Paul A.: *See*—
Bouchard, Andre C.; Thibault, Paul A.; and Lagushenko, Radomir I., 4,678,520, Cl. 148-6.350.
Thomas, Dwight J.; and Ashelin, Charles J., to Kennecott Corporation. Seamless vessel for self contained filter assembly. 4,678,577, Cl. 210-441.000.
Thomas, Glenn R.: *See*—
McKee, Jere L.; and Thomas, Glenn R., 4,679,018, Cl. 335-167.000.
Thomas, Keith E., to Capitol Records, Inc. Portable playback system with active tape drive tensioning feature. 4,679,108, Cl. 360-130.310.
Thomas, Terence N.: *See*—
Hogeboom, John G.; and Thomas, Terence N., 4,679,209, Cl. 375-17.000.
Thompson, Mark E.: *See*—
Hanagan, Mary A.; and Thompson, Mark E., 4,678,502, Cl. 71-93.000.
Thompson, Richard E., to Lucas Industries Public Limited Company. Internal shoe-drum brake. 4,678,067, Cl. 188-328.000.
Thomson, Ian, to Thomson & Nielsen Electronics Ltd. Dosimeter. 4,678,916, Cl. 250-370.000.
Thomson & Nielsen Electronics Ltd.: *See*—
Thomson, Ian, 4,678,916, Cl. 250-370.000.
Thomson Video Equipment: *See*—
Catros, Jean-Yves; and Michler, Denis, 4,679,079, Cl. 358-135.000.
Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., to Becton, Dickinson and Company. Automatic random access analyzer. 4,678,752, Cl. 435-291.000.
Thrall Car Manufacturing Company: *See*—
Baker, William R.; Marulic, Walter J.; and Robertson, James C., 4,677,918, Cl. 105-378.000.
Thulin, Robert R., to Nabisco Brands, Inc. Apparatus for continuously forming latticed pastry goods. 4,678,418, Cl. 425-115.000.
Thurin, Jan: *See*—
Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettgen, Herbert F., 4,678,747, Cl. 435-7.000.
Tice, William A. Card feeding apparatus. 4,677,923, Cl. 112-104.000.
Ticks, Gerd-Heinz: *See*—
Rohner, Gerhard; Schweikert, Willi; and Ticks, Gerd-Heinz, 4,678,203, Cl. 280-707.000.
Tie/Communications, Inc.: *See*—
Korsky, Vincent V.; and Keenan, Ronald M., 4,679,228, Cl. 379-165.000.
Tielemans, Leonardus P. M.; and Van Roemburg, Franciscus M. J., to U.S. Philips Corporation. Radial spiral-groove bearing. 4,678,348, Cl. 384-114.000.
Tilles, Robert S.: *See*—
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.
Time and Data Systems International Limited: *See*—
Rudland, Peter E., 4,678,898, Cl. 235-468.000.
Titanium Metals Corporation of America (TIMET): *See*—
Bania, Paul J., 4,678,506, Cl. 75-10.250.
Tkaczyk, Richard J.: *See*—
Iadipaolo, Rene M.; and Tkaczyk, Richard J., 4,678,920, Cl. 250-560.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Fujita, Masahito; Miyazaki, Makoto; Kizaki, Masami; Nagashima, Yukio; and Shimbori, Yuichi, 4,678,768, Cl. 502-119.000.
Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihiro; and Makishima, Tokuo, 4,678,767, Cl. 502-104.000.
Tobler, Paul: *See*—
Punzar, Marianne; Marti, Franz; Mercier, Robert; Tobler, Paul; and Buttiker, Rudolf, 4,678,852, Cl. 544-194.000.
Toda, Haruki: *See*—
Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, 4,678,934, Cl. 307-279.000.
Toda, Minoru, to RCA Corporation. Piezoelectric positioning device. 4,678,955, Cl. 310-328.000.
Todaro, Frank A.; Castonguay, Roger N.; Krajewski, Alexander A.; and Morris, Robert A., to General Electric Company. Trip actuator for molded case circuit breakers. 4,679,019, Cl. 335-172.000.
Toepfer, Dieter: *See*—
Heist, Hans; Toepfer, Dieter; and Britzke, Sylvia, 4,678,310, Cl. 354-319.000.
Tofield, Robert H.: *See*—
Alling, Richard L.; Shepard, Richard W.; Landrum, Clyde L.; Tofield, Robert H.; and Podhajecki, Stephen T., 4,677,720, Cl. 29-148.40C.
Toho Beslon Co., Ltd.: *See*—
Honda, Kenji, deceased; and Sawafuji, Tadaaki, 4,677,818, Cl. 57-224.000.
Tokunaga, Fumihiro; Asai, Takamitsu; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,678,706, Cl. 428-323.000.
Tokura, Yoshinori: *See*—
Hanamura, Eiichi; and Tokura, Yoshinori, 4,678,736, Cl. 430-270.000.
Tokyo Rope Manufacturing Co., Ltd.: *See*—
Honda, Kenji, deceased; and Sawafuji, Tadaaki, 4,677,818, Cl. 57-224.000.
Tomasi, Jean-Pierre, to U.S. Philips Corporation. Terminal-guidance or position-adjustment system for aircraft using distance and angle measurements. 4,679,047, Cl. 342-52.000.
Tomic, Dobrivoje. Pharmaceutical compositions for the treatment of diabetes and of hepatic diseases and malfunctions. 4,678,670, Cl. 424-127.000.
Tominaga, Kazutoshi, to Kabushiki Kaisha Tominaga Jyushi Kogyosho. Gymnastic device for small pet animals. 4,677,938, Cl. 119-29.000.
Tomioka, Kentaro: *See*—
Kondo, Kenji; Katsuyama, Shigeru; Akahane, Shoji; and Tomioka, Kentaro, 4,678,436, Cl. 433-228.100.
Tomita, Kazuyuki; and Tanno, Masuo, to Matsushita Electric Industrial Co., Ltd. Dry-etching method. 4,678,539, Cl. 156-643.000.
Tomita, Masao, to Matsushita Electric Industrial Co., Ltd. Method of recording and reproducing video and audio signals on a magnetic tape. 4,679,097, Cl. 358-328.000.
Tonamura, Masashi: *See*—
Obara, Haruki; Ito, Masaya; and Tonamura, Masashi, 4,678,884, Cl. 219-69.00P.
Tondre, Stephen L.; and Lunk, Hans E., to Raychem Corporation. Electrical insulation. 4,678,709, Cl. 428-380.000.
Tone, Masatsugu, to Kubota Ltd. Coupling system and double shaft transmission structure for an argicultural tractor. 4,677,866, Cl. 74-15.860.
Topper, Robert J.; and Dischert, Robert A., to RCA Corporation. Method and apparatus for freezing a television picture. 4,679,084, Cl. 358-160.000.
Topura Co., Ltd.: *See*—
Yamasaki, Katsuhisa, 4,677,703, Cl. 10-9.000.

Torawaki, Takao: *See—*
Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegasi, Takasi; and Yamaoka, Isao, 4,677,934, Cl. 118-58.000.

Toray Industries, Inc.: *See—*
Nogi, Tatsuo; Iwami, Tomonori; and Tanaka, Kazumi, 4,678,581, Cl. 210-500.230.

Torbus, Marek, to Huttenes-Albertus Chemische Werke GmbH. Mould material binding agent system which cold-hardens with formation of polyurethane. 4,678,816, Cl. 523-142.000.

Torii, Yasuyoshi: *See—*
Sekiya, Tadashi; Tsuzuki, Akihiro; and Torii, Yasuyoshi, 4,678,732, Cl. 430-136.000.

Tornier, Alain. Coupling assembly for joining an implant tool to a bone implant. 4,677,972, Cl. 128-92.00V.

Torrano, Michael A., Jr.; Lyon, George E.; and Haddick, David H., to LogE/Dunn Instruments, Inc. Method and apparatus for photographing video images of either polarity without CRT brightness or contrast readjustment. 4,679,087, Cl. 358-168.000.

Torrington Company, The: *See—*
Alling, Richard L.; Shepard, Richard W.; Landrum, Clyde L.; Tofield, Robert H.; and Podhajecki, Stephen T., 4,677,720, Cl. 29-148.40C.

Toukan, Sameeh S., to Pennwalt Corporation. Polymers and lubricant additives of alkylene dithiothiadiazoles and alkylene cyanodithioimidocarbonates. 4,678,592, Cl. 252-25.000.

Toussaint, Hans-Norbert: *See—*
Fink, Ludwig; and Toussaint, Hans-Norbert, 4,678,265, Cl. 350-96.200.

Toyama, Sumio: *See—*
Kikuchi, Masafumi; Onodera, Toshio; Toyama, Sumio; and Sakamoto, Hiroshi, 4,679,091, Cl. 358-242.000.

Toyo Cci Kabushiki Kaisha: *See—*
Fujinuma, Katsumi; Takase, Tsuneyoshi; and Hayashi, Yoriyuki, 4,677,976, Cl. 128-201.250.

Toyo Lnt Free Co., Ltd.: *See—*
Tanaka, Norito, 4,677,696, Cl. 2-84.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Miyazaki, Hiroshi; Arika, Junji; and Aimoto, Michiyuki, 4,678,651, Cl. 423-329.000.

Toyoda Gosei Co., Ltd.: *See—*
Kai, Toru; and Kato, Kouichi, 4,678,421, Cl. 425-159.000.
Maeno, Kunio; and Kisanuki, Hisayuki, 4,678,696, Cl. 428-122.000.

Toyokawa, Yasufumi: *See—*
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,678,496, Cl. 71-76.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibatani, Juichi, 4,678,064, Cl. 188-73.450.
Fukuta, Kenji; Kaneko, Takaoki; and Takáhashi, Yoshinobu, 4,678,644, Cl. 422-186.050.
Futamura, Kazumasa, 4,677,945, Cl. 123-90.480.
Ito, Toshimitsu; and Okamoto, Akio, 4,677,954, Cl. 123-478.000.
Nomura, Kazuhiro, 4,678,198, Cl. 280-153.00A.
Ohe, Junzo; and Kondo, Hiroshi, 4,679,052, Cl. 343-712.000.
Taniyama, Kiyoshi; and Hori, Hiroshi, 4,677,871, Cl. 74-467.000.
Yoshinaka, Toshio; and Nagano, Syuji, 4,678,055, Cl. 180-247.000.

Tractech, Inc.: *See—*
Dissett, Walter L., 4,677,876, Cl. 74-715.000.

Trahan, Wesley J.; and Montandon, Albert B. Temperature responsive gas controller apparatus. 4,678,117, Cl. 236-92.00A.

Transformatoren Union Aktiengesellschaft: *See—*
Stein, Werner; and Muller, Walter, 4,678,927, Cl. 307-104.000.

Traxler, Manfred: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.

Trepanier, Fernand. Windmill. 4,678,923, Cl. 290-55.000.

Trethewey, Paul M., to Grass Valley Group, Inc., The. Bar/dot level meter. 4,679,042, Cl. 340-754.000.

Triangle Tool Corporation: *See—*
Brock, Robert E., 4,678,158, Cl. 249-161.000.

Tricon Industries: *See—*
Ban, Thomas R.; Dusterhoft, Ernest E.; and Gilmore, John E., 4,678,365, Cl. 404-118.000.

Trigari, Silvana: *See—*
Russo, Vera; Sottini, Stefano; Righini, Giancarlo; and Trigari, Silvana, 4,678,268, Cl. 350-96.180.

Trimmel, Wolfgang: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.

Troxell, Lillian H.: *See—*
Johnston, Howard; and Troxell, Lillian H., 4,678,509, Cl. 71-94.000.

Trubiano, Antoine, to Cari All Inc. Shopping cart apparel hanger. 4,678,195, Cl. 280-33.99A.

True, Thomas T., to General Electric Company. Method and apparatus for enhancing magenta modulation of a light valve projector. 4,679,070, Cl. 358-62.000.

Tsai, Yih-Wan, to PPG Industries, Inc. Reduction of material buildup by means of gas jet. 4,678,491, Cl. 65-27.000.

Tsao, Ying-Yen P.: *See—*
Le, Quang N.; Tsao, Ying-Yen P.; and Wong, Stephen S., 4,678,764, Cl. 502-26.000.

Tsuboi, Shinichi: *See—*
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,678,795, Cl. 514-341.000.

Tsuchiya, Soji: *See—*
Yoshimura, Susumu; Kudoh, Yasuo; Tsuchiya, Soji; Kojima, Toshikuni; and Takahashi, Shohzoh, 4,679,124, Cl. 361-433.000.

Tsuda, George L., to Hughes Aircraft Company. Single channel tracking for frequency hopping communication systems. 4,679,207, Cl. 375-1.000.

Tsuda, Toshitaka: *See—*
Fukuda, Misao; Tsuda, Toshitaka; Murano, Kazuo; and Awata, Yutaka, 4,679,188, Cl. 370-29.000.

Tsuezuki, Yoshio: *See—*
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,678,733, Cl. 430-57.000.

Tsugane, Syuzo; and Nishiwaki, Mitsuo, to NEC Corporation. System for coding video signal in block unit. 4,679,081, Cl. 358-138.000.

Tsuji, Tomoji: *See—*
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Tsuji, Tomoji; and Wakui, Natsuko, 4,678,858, Cl. 568-902.000.

Tsujii, Fumio; Matsuoka, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, to Hitachi, Ltd. Navigation system with capability of instructing running direction. 4,679,147, Cl. 364-449.000.

Tsujii, Kanji: *See—*
Murayama, Seiichi; Tsujii, Kanji; and Yajima, Yusuke, 4,678,536, Cl. 156-635.000.

Tsujimoto, Jun-ichi, to Kabushiki Kaisha Toshiba. Semiconductor memory device with a bit error detecting function. 4,679,196, Cl. 371-51.000.

Tsukamoto, Masahide: *See—*
Yoshikawa, Yoshitaka; Tsukamoto, Masahide; Nishimura, Yutaka; Ono, Hitoshi; and Sano, Tetsuhiro, 4,679,054, Cl. 346-76.0PH.

Tsukase, Masaaki: *See—*
Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masasi; and Tsukase, Masaaki, 4,678,735, Cl. 430-203.000.
Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.

Tsukimoto, Takayuki: *See—*
Izukawa, Kazuhiro; Tsukimoto, Takayuki; and Okumura, Ichiro, 4,678,956, Cl. 310-323.000.

Tsunekawa, Masaru: *See—*
Hasegawa, Masahiko; Naito, Yoshihiro; Tsunekawa, Masaru; and Momose, Yutaka, 4,677,824, Cl. 60-521.000.

Tsunekawa, Tokuichi: *See—*
Sato, Yuichi; Tsunekawa, Tokuichi; and Kawabata, Takashi, 4,678,323, Cl. 365-4.000.

Tsunoda, Arihiro: *See—*
Akiyama, Kazunori; Tsunoda, Arihiro; and Tanaka, Satoshi, 4,678,178, Cl. 271-242.000.

Tsunoda, Teruo, to Komori Printing Machinery Co., Ltd. Apparatus for detecting image area of thin plate. 4,678,336, Cl. 356-380.000.

Tsuruda, Wataru: *See—*
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.

Tsutsu, Hiroshi: *See—*
Ikedo, Masaru; Watari, Masafumi; Hayashi, Yoshiaki; Yamamoto, Osamu; and Tsutsu, Hiroshi, 4,678,275, Cl. 350-96.340.

Tsuzuki, Akihiro: *See—*
Sekiya, Tadashi; Tsuzuki, Akihiro; and Torii, Yasuyoshi, 4,678,732, Cl. 430-136.000.

Tucker, James E.: *See—*
Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, 4,677,964, Cl. 126-41.00R.

Tullos, Hugh S.: *See—*
Noble, Philip C.; Tullos, Hugh S.; and Davidson, John P., 4,678,471, Cl. 623-16.000.

Tung, Chi F.; and Bacon, Chester A., Jr., to Minnesota Mining and Manufacturing Company. Encapsulated flattop retroreflective sheeting and method for producing the same. 4,678,695, Cl. 428-120.000.

Tungsram Rt.: *See—*
Csapody, Miklos, 4,678,958, Cl. 313-15.000.

Tuomi, Roger L., to United States of America, Agriculture. Wooden building system with flange interlock and beams for use in the system. 4,677,806, Cl. 52-656.000.

Turbo's Investigacion Energetica: *See—*
Valencia, Alvaro G., 4,677,957, Cl. 123-572.000.

Turner, Larry R.: *See—*
Hull, John R.; Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., 4,678,024, Cl. 164-503.000.

Tuse, Daniel: *See—*
Casey, Irene; and Tuse, Daniel, 4,678,658, Cl. 424-7.100.

Twardowski, Zbigniew, to ERCO Industries Limited. Acid recovery in clorine dioxide generation. 4,678,655, Cl. 423-478.000.

Tybar Engineering Pyt. Ltd.: *See—*
Bartlett, Ian G.; and Lymer, Donald A., 4,678,533, Cl. 156-435.000.

Tyihak, Erno : *See—*
Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.

Tytgat, Daniel; and Lefevre, Pierre, to Solvay & Cie. (Societe Anonyme). Baths and process for chemical polishing of stainless steel surfaces. 4,678,541, Cl. 156-664.000.

Tzeng, Wen-Shian V., to Chomerics, Inc. Electromagnetic shielding. 4,678,716, Cl. 428-551.000.

Uber, Arthur E., III: *See*—
Reilly, David M.; and Uber, Arthur E., III, 4,677,980, Cl. 128-655.000.

Ubermeier, Dieter: *See*—
Buder, Eckart; Metz, Hans-Ulrich; and Ubermeier, Dieter, 4,678,726, Cl. 429-88.000.

Uchida, Kohachi; Shibuya, Kunihiro; and Nakamura, Hajime, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,678,314, Cl. 355-5.000.

Uchida, Shinji: *See*—
Furuta, Mitsuo; and Uchida, Shinji, 4,678,244, Cl. 305-57.000.

Uchida, Yasumi: *See*—
Shiratsuchi, Masami; Kawamura, Kiyoshi; Akashi, Toshihiro; Ishihama, Hiroshi; and Uchida, Yasumi, 4,678,803, Cl. 514-456.000.

Uchimura, David H., to Tegal Corporation. Plasma etch process. 4,678,540, Cl. 156-643.000.

Uchiyama, Winston S.: *See*—
Parfomak, Eva H.; and Uchiyama, Winston S., 4,678,594, Cl. 252-186.310.

Udagawa, Yoshio. Trackway toy assembly. 4,678,449, Cl. 446-136.000.

Ueda, Chie: *See*—
Ueda, Iwao, 4,678,567, Cl. 210-150.000.

Ueda, Iwao, to Ueda, Iwao; and Ueda, Chie. Activated sludge process bed. 4,678,567, Cl. 210-150.000.

Ueda, Toshio; Kageno, Kenji; and Harada, Susumu, to Nitto Boseki Co., Ltd. Method for improving color fastness of reactive dyes on cellulose with allylamine copolymer. 4,678,474, Cl. 8-543.000.

Uehara, Kiyohiro: *See*—
Ohta, Wasaburo; Enomoto, Takamichi; and Uehara, Kiyohiro, 4,678,285, Cl. 350-345.000.

Ueki, Satoshi: *See*—
Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihiro; and Makishima, Tokuo, 4,678,767, Cl. 502-104.000.

Uemura, Hiroshi: *See*—
Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibatani, Juichi, 4,678,064, Cl. 188-73.450.

Ulman, John, to Personal Products Company. Method for making nonplanar absorbent products. 4,678,527, Cl. 156-213.000.

Umehara, Hajime: *See*—
Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.

Umemura, Shinichiro: *See*—
Ogawa, Toshio; Kondo, Shinichi; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,679,176, Cl. 367-119.000.

Umezawa, Toshimitsu, to Kabushiki Kaisha Toshiba. Automatic white control circuit for color television receiver. 4,679,065, Cl. 358-29.000.

Union Carbide Corporation: *See*—
Atkins, Kenneth E.; Gandy, Raymond C.; and Larck, William A., 4,678,711, Cl. 428-414.000.
Burwell, William H., 4,679,206, Cl. 373-91.000.
Chiang, Robert L.; and Stanilulis, Mark T., 4,678,765, Cl. 502-65.000.
Manning, David T., 4,678,501, Cl. 71-92.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Copp, Warren K., 4,677,713, Cl. 24-590.000.
White, Anthony M., 4,679,063, Cl. 357-30.000.

United Pharmaceuticals, Inc.: *See*—
Davis, William M., 4,678,780, Cl. 514-183.000.

United States of America
Agriculture: *See*—
Jochim, Michael M.; and Jones, Suzanne C., 4,678,746, Cl. 435-5.000.
Tuomi, Roger L., 4,677,806, Cl. 52-656.000.
Vigo, Tyrone L.; and Blanchard, Eugene J., 4,678,473, Cl. 8-480.000.
Air Force: *See*—
Hirschfeld, Tomas B., 4,678,142, Cl. 244-3.160.
May, Roger A., 4,679,086, Cl. 358-167.000.
Schneider, Josef F., 4,678,999, Cl. 324-427.000.
Army: *See*—
Christopulos, John A., 4,678,728, Cl. 429-121.000.
Mon, George, 4,678,009, Cl. 137-818.000.
Rearick, Thomas C., 4,679,164, Cl. 364-728.000.
Energy: *See*—
Gay, Don D.; and McMillan, William G., 4,677,863, Cl. 73-863.120.
Gutschick, Vincent P.; Barron, Michael H.; Waechter, David A.; and Wolf, Michael A., 4,678,330, Cl. 356-222.000.
Hull, John R.; Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., 4,678,024, Cl. 164-503.000.
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Mikulas, Martin M., Jr.; Rhodes, Marvin D.; and Simonton, J. Wayne, 4,677,803, Cl. 52-646.000.
Vykukal, Hubert C., 4,678,438, Cl. 434-34.000.
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Burns, William K.; and Milton, A. Fenner, 4,678,267, Cl. 350-96.150.

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Andrea, Johan; Lubchenko, Eugene; and Bradley, Ralph H., 4,679,069, Cl. 358-60.000.
Blanken, Pieter G.; and van der Zee, Pieter, 4,679,092, Cl. 358-242.000.
Blood, Peter, 4,678,989, Cl. 324-158.00D.
Comberg, Albert A.; and Schroder, Johann, 4,678,961, Cl. 313-36.000.
Coursant, Roger H., 4,677,981, Cl. 128-660.000.
den Broeder, Friedrich J. A.; Draaisma, Henricus J. G.; and Kahle, Alexander, 4,678,721, Cl. 428-607.000.
Hermens, Joannes L. G., 4,678,918, Cl. 250-374.000.
Mewissen, Jan A. C., 4,678,959, Cl. 313-17.000.
Peels, Antonius H. P. M., 4,678,964, Cl. 313-414.000.
Riffiod, Michel M. R., 4,679,049, Cl. 342-172.000.
Schmitz, Herman J. R.; Annegarn, Marcellinus J. J. C.; and Fekkes, Wilhelmus F., 4,679,083, Cl. 358-147.000.
Tielemans, Leonardus P. M.; and Van Roemburg, Franciscus M. J., 4,678,348, Cl. 384-114.000.
Tomasi, Jean-Pierre, 4,679,047, Cl. 342-52.000.
Vanbrabant, Jean-Pierre C. R., 4,679,192, Cl. 370-85.000.
van Sluys, Robert N. J., 4,679,185, Cl. 369-255.000.
van Weert, Michael J. C.; and van Limpt, Gerardus C. S. W., 4,678,965, Cl. 313-451.000.

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Adell, Robert, 4,677,790, Cl. 49-462.000.

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Maker, Lewis W.; and Nicholson, Horace, 4,678,084, Cl. 206-597.000.

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Bradford, Michael P.; and Maciolek, Joseph R., 4,678,401, Cl. 416-32.000.
Craig, Preston S.; and Arendale, William F., 4,678,328, Cl. 356-141.000.
Koczarski, Jack B., 4,678,378, Cl. 408-46.000.
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McElroy, James F., 4,678,724, Cl. 429-34.000.
Pike, Roscoe A., 4,678,820, Cl. 523-200.000.
Schmidt, Samuel, 4,678,991, Cl. 324-207.000.

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Gutman, Robert F., 4,678,872, Cl. 200-5.00R.

Univention Inc.: *See*—
Kaye, Gordon E.; and Agnello, Joseph A., Jr., 4,677,782, Cl. 42-100.000.

University of Auckland, The: *See*—
Edgar, Brian W.; and Elliott, Robert B., 4,677,975, Cl. 128-200.140.

University of Florida: *See*—
Melker, Richard J., 4,677,978, Cl. 128-207.140.

University of Tokyo: *See*—
Sugano, Takuo; Okabe, Yoichi; Miyake, Hideharu; and Fukaya, Naoki, 4,678,945, Cl. 307-476.000.

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Krueger, Gerald G., 4,677,968, Cl. 128-1.00R.

Upmeier, Hartmut, to Windmoller & Holscher. Apparatus for cooling tubular plastic film extruded from a film blowing head. 4,678,417, Cl. 425-72.00R.

Urabe, Shigeharu: *See*—
Yamada, Sumito; Mifune, Hiroyuki; and Urabe, Shigeharu, 4,678,745, Cl. 430-569.000.

Uragami, Akira; Suzuki, Yukio; Kadono, Shinji; Iwamura, Masahiro; Masuda, Ikuro; and Yamauchi, Tatsumi, to Hitachi, Ltd. Inverting logic buffer BICMOS switching circuit using an enabling switch for three-state operation with reduced dissipation. 4,678,943, Cl. 307-473.000.

Urata, Kazuo: *See*—
Kamoshita, Yasuhiko; Tamaru, Takuya; Ogusu, Mikio; and Urata, Kazuo, 4,679,182, Cl. 369-77.200.

Urfer, Allen D.: *See*—
Malik, Arshad H.; Urfer, Allen D.; McDaniel, Robert S.; and Johnson, Donald L., 4,678,595, Cl. 252-174.170.

Uriuhara, Makoto: *See*—
Hattori, Toshihiro; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,677,880, Cl. 74-866.000.

Usami, Hiroko; Yamamoto, Akihiro; Sugawara, Yutaka; Kotani, Shozo; and Kato, Keijiro, to Chugai Seiyaku Kabushiki Kaisha. Antitumor agent. 4,678,773, Cl. 514-25.000.

Usui, Hideo: *See*—
Yamada, Kohzaburoh; Ichijima, Seiji; and Usui, Hideo, 4,678,743, Cl. 430-551.000.

Usunov, Petko D.: *See*—
Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.

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Tamura, Kaoru; Yasuhiro, Kawai; and Utsumi, Isao, 4,678,180, Cl. 271-296.000.

Vaillancourt, Vincent L. Sterile catheter securement device. 4,678,462, Cl. 604-180.000.

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Belluteau, Jean-Pierre; Bocard, Christian; Such, Christian; and Vaillant, Daniel, 4,678,558, Cl. 208-390.000.

Vajgart, Jeffery L.: *See*—
Vrabel, Robert J.; Vajgart, Jeffery L.; Staszel, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.

Valchar, Martin: *See*—
Protiva, Miroslav; Jilek, Jiri; Cervena, Irena; Dlabac, Antonin; Valchar, Martin; and Pomykacek, Josef, 4,678,788, Cl. 514-254.000.

Valencia, Alvaro G., to Turbo's Investigacion Energetica. Control system for internal combustion engines. 4,677,957, Cl. 123-572.000.

Valley, Harold J. Faucet valve with adjustable stem tightener. 4,678,002, Cl. 137-315.000.

Valmet-Dominion Inc.: *See*—
Futcher, Ralph J., 4,677,762, Cl. 34-114.000.

Vanbrabant, Jean-Pierre C. R., to U.S. Philips Corporation. Arrangement for transmitting digital data. 4,679,192, Cl. 370-85.000.

Vandenbergh, Peter A.; and Vidaver, Anne K., to Microlife Technics, Inc. Method and compositions for use in the treatment of fireblight. 4,678,750, Cl. 435-200.000.

Vandermark, Frank: *See*—
Dong, Michael W.; Yarbro, Stanley K.; and Vandermark, Frank, 4,678,639, Cl. 422-81.000.

van der Zee, Pieter: *See*—
Blanken, Pieter G.; and van der Zee, Pieter, 4,679,092, Cl. 358-242.000.

Van De Velde, Jean-Claude: *See*—
Constant, Eugene; Leroy, Yves; and Van De Velde, Jean-Claude, 4,677,988, Cl. 128-736.000.

Vandevier, Joseph E.; Bearden, John L.; Pranger, William F.; and Miller, Harold L., to Hughes Tool Company. Resistant components for submersible pump stages. 4,678,399, Cl. 415-199.200.

Vandevier, Joseph E.: *See*—
Lorett, Jerzy A.; and Vandevier, Joseph E., 4,678,404, Cl. 417-45.000.

Van Duyn, Paul D.; and Geddie, John D., to General Motors Corporation. Headlamp bulb retaining arrangement. 4,679,128, Cl. 362-306.000.

Van Gompel, Paul T.; and Suprise, Jody D., to Kimberly-Clark Corporation. Web with adjustable opening and method of making the same. 4,677,695, Cl. 2-79.000.

Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. Polyanionic compounds derived from aromatic ethers of polyglycerols. 4,678,665, Cl. 424-72.000.

van Limpt, Gerardus C. S. W.: *See*—
van Weert, Michael J. C.; and van Limpt, Gerardus C. S. W., 4,678,965, Cl. 313-451.000.

van Maaren, Richard D.: *See*—
Bracht, Jeffrey L.; Heinrich, Martin W.; van Maaren, Richard D.; and Sleder, Richard L., 4,677,940, Cl. 123-2.000.

Vannauker, David L.: *See*—
Hicks, Michael S.; and Vannauker, David L., 4,678,556, Cl. 208-96.000.

Van Nostrand, Willard R. Mirror assembly for determining distance to passed vehicle. 4,678,294, Cl. 350-611.000.

Van Roemburg, Franciscus M. J.: *See*—
Tielemans, Leonardus P. M.; and Van Roemburg, Franciscus M. J., 4,678,348, Cl. 384-114.000.

Van Rysselberghe, Pierre C.: *See*—
Rapkin, Myron C.; Schoengold, Ronald J.; Shockey, David R.; and Van Rysselberghe, Pierre C., 4,678,757, Cl. 436-169.000.

Van Sickler, Robert H., to General Electric Company. Miniature lamp arrays having improved lamp retention features. 4,679,126, Cl. 362-226.000.

van Sluys, Robert N. J., to U.S. Philips Corporation. Pivotal-arm device for a disc scanning unit. 4,679,185, Cl. 369-255.000.

Van Steenburg, Kip. Child car seat convertible into a stroller. 4,678,196, Cl. 280-47.410.

van Voskuilen, Dirk F.; and van Voskuilen, Frans. Method and apparatus for removing pipe coatings. 4,677,998, Cl. 134-181.000.

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van Voskuilen, Dirk F.; and van Voskuilen, Frans, 4,677,998, Cl. 134-181.000.

van Weert, Michael J. C.; and van Limpt, Gerardus C. S. W., to U.S. Philips Corporation. Electron tube. 4,678,965, Cl. 313-451.000.

Varta Batterie Aktiengesellschaft: *See*—
Buder, Eckart; Metz, Hans-Ulrich; and Ubermeier, Dieter, 4,678,726, Cl. 429-88.000.

Vasseghi, Nader; Goddard, Donald G.; and Eccles, Robert E., to Advanced Micro Devices, Inc. TTL compatible merged bipolar/-CMOS output buffer circuits. 4,678,940, Cl. 307-446.000.

Vatland, Arnfinn: *See*—
Dahl, Erik Q.; Vatland, Arnfinn; and Vegge, Olaf T., 4,678,434, Cl. 432-242.000.

Vegge, Olaf T.: *See*—
Dahl, Erik Q.; Vatland, Arnfinn; and Vegge, Olaf T., 4,678,434, Cl. 432-242.000.

Ventura, Frank D., to Kenner Parker Toys Inc. Interfitting toy vehicle body and chassis. 4,678,451, Cl. 446-471.000.

Verduin, Lee C.: *See*—
Hoffman, David; Verduin, Lee C.; and Ouwinga, Ross, 4,677,777, Cl. 40-460.000.

Verhulst, Michael J.; and Anstey, Henry D., to Deere & Company. System for automatically enveloping a large round bale with a wrapping. 4,677,807, Cl. 53-118.000.

Vermeulen-Hollandia Octrooien II B.V.: *See*—
Boots, Robert T., 4,678,228, Cl. 296-216.000.

Verzar-Petri, Gisela: *See*—
Meszaros, Sandor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno ; Nyiredy, Szabolcs; Meier, Best; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.

Vetco Offshore, Inc.: *See*—
Guice, Walter L., 4,678,209, Cl. 285-144.000.

Veuhoff, Heinz: *See*—
Heidenreich, Peter; Heinen, Karl-Heinz; Muller, Wolfgang; and Veuhoff, Heinz, 4,679,205, Cl. 373-84.000.

VIAFRANCE and State of France as represented by the Ministry of Urban Planning, Housing and Transportation, Central Laboratory of Roads and Bridges: *See*—
Charonnat, Yves; and Larribe, Lucien, 4,678,364, Cl. 404-105.000.

Vickery, Andrew J.: *See*—
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.

Victaulic Company of America: *See*—
De Raymond, Peter G., 4,678,208, Cl. 285-112.000.

Vidaver, Anne K.: *See*—
Vandenbergh, Peter A.; and Vidaver, Anne K., 4,678,750, Cl. 435-200.000.

Videocolor: *See*—
Fonda, Carlo L., 4,678,963, Cl. 313-405.000.

Vigilante, John J.: *See*—
Scalamandre, Joseph; and Vigilante, John J., 4,678,156, Cl. 249-34.000.

Vigilante, Michael L.: *See*—
Scalamandre, Joseph; and Vigilante, John J., 4,678,156, Cl. 249-34.000.

Vigo, Tyrone L.; and Blanchard, Eugene J., to United States of America, Agriculture. Arlysulfonium cellulosic fibers substantive to many dye classes. 4,678,473, Cl. 8-480.000.

Vikterlof, Karl-Johan; and Palsgard, Gote. Means for registering coordinates. 4,679,076, Cl. 358-107.000.

Vilhelmsson, Kennet, to Radians AB. High power optical fiber with improved covering. 4,678,273, Cl. 350-96.300.

Vinarub, Edmond I.: *See*—
Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., 4,679,029, Cl. 340-347.00P.

Vinnemann, Antonius; and Koninger, Veit, to Gebhard Balluff GmbH & Co. Distance measuring device operating with torsional ultrasonic waves detected without mode conversion. 4,678,993, Cl. 324-208.000.

Viola, Frank J.; and Hubner, Henry H., Jr., to Parker Hannifin Corporation. Carrier tool. 4,678,217, Cl. 294-16.000.

Viragate Limited: *See*—
Bowyer, William H.; Crocker, Robert L.; Hansford, Christopher M.; Parker, Leslie K.; and Gray, Nigel, 4,678,194, Cl. 273-373.000.

Virkar, Anil; and Yuan, Thomas C., to Dow Chemical Company, The. Sinterable and strengthened magnesium oxide ceramic materials. 4,678,761, Cl. 501-104.000.

Visek, Tomas; Czaby, Gottfried; and Nowotny, Georg, to Steyr-Daimler-Puch AG. Unit for coupling a displaceable operating bar or shaft with a regulating member, in particular with an adjusting rod of a fuel injection aggregate in an internal combustion engine. 4,677,952, Cl. 123-372.000.

Visic, Inc.: *See*—
Logwood, Dennis J.; Haq, Mohammed E. U.; Reed, John A.; and Karp, Joel A., 4,679,171, Cl. 365-154.000.

Voest-Alpine Aktiengesellschaft: *See*—
Enkner, Bernhard; Amon, Leopoid; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
Enkner, Bernhard; Stephani, Dietmar; Schropp, Leopold; and Stastny, Wilhelm, 4,678,419, Cl. 425-143.000.

Vogelsong, Thomas L.: *See*—
Lillquist, Robert D.; Pimbley, Joseph M.; and Vogelsong, Thomas L., 4,679,068, Cl. 358-44.000.

Voinche, Jack L.; and Martien, James C. Water distillation method. 4,678,587, Cl. 210-748.000.

Volk, Joseph A., Jr.; and Kniepmann, Mark R., to Beta Raven Inc. Controlled fat injection with steam in a pellet mill. 4,678,424, Cl. 425-331.000.

Vollmer Werke Maschinenfabrik GmbH: *See*—
Beck, Ernst; Lenard, Peter; and Hutzel, Hans, 4,677,882, Cl. 76-77.000.

Volnak, William M. Chording keyboard for generating binary data. 4,679,030, Cl. 340-365.00A.

vom Braucke, Hans; vom Braucke, Manfred; and Westerwelle, Dieter, to Bielefelder Kuchenmaschinen-und Transportgeratefabrik vom Braucke GmbH. Hand tool for loosening soil. 4,678,043, Cl. 172-349.000.

vom Braucke, Manfred: *See*—
vom Braucke, Hans; vom Braucke, Manfred; and Westerwelle, Dieter, 4,678,043, Cl. 172-349.000.

Vrabel, Robert J.; Vajgart, Jeffery L.; Staszel, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., to Ford Motor Company. Motor control circuit for motor driven power windows. 4,678,975, Cl. 318-266.000.

VS Remek Limited: *See*—
Simon, Lewis A.; and Scarffe, Michael F., 4,677,756, Cl. 33-514.000.

Vsesojuzny Institut Po Proektirovaniju Organizatsii Energeticheskogo Stroitelstva: *See*—
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.

Vsesojuzny Nauchno-Issledovatelsky I Konstruktorsky Institut Tsvetmetavtomatika: *See*—
Gluschenko, Nikolai N.; Golikov, Vladislav V.; and Emelyanov, Viktor A., 4,677,864, Cl. 73-863.510.

Vukmanic, Ronald W., to Chicago Metallic Corporation. Suspended ceiling system and runner. 4,677,802, Cl. 52-488.000.

Vykukal, Hubert C., to United States of America, National Aeronautics and Space Administration. Weightlessness simulation system and process. 4,678,438, Cl. 434-34.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
Feldmann, Joachim, 4,677,857, Cl. 73-855.000.

Waco Jonsereds AB: *See*—
Andersson, Bengt A., 4,677,733, Cl. 29-563.000.

Wacom Co., Ltd.: *See*—
Taguchi, Yoshinori; and Yamanami, Tsuguya, 4,678,870, Cl. 178-19.000.

Wada, Katsuo: *See*—
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.

Waechter, David A.: *See*—
Gutschick, Vincent P.; Barron, Michael H.; Waechter, David A.; and Wolf, Michael A., 4,678,330, Cl. 356-222.000.

Wages, Dwight E.: *See*—
Akhter, Lalarukh; Atkinson, Ronald E.; Wages, Dwight E.; and Beyer, Harold H., 4,678,606, Cl. 252-542.000.

Wagner, Wolfgang: *See*—
Losch, Hans-Wilhelm; Kleinrahm, Rainer; Pieperbeck, Norbert; and Wagner, Wolfgang, 4,678,048, Cl. 177-212.000.

Wakui, Natsuko: *See*—
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Tsuji, Tomoji; and Wakui, Natsuko, 4,678,858, Cl. 568-902.000.

Walden, Michael F. M.: *See*—
Erben, Ralf; and Walden, Michael F. M., 4,678,065, Cl. 188-196.00D.

Wall, Robert L.: *See*—
Olsen, Dwight; and Wall, Robert L., 4,678,931, Cl. 310-201.000.

Walsh, John S.: *See*—
Miwa, Gerald T.; and Walsh, John S., 4,678,799, Cl. 514-398.000.

Walter C. McCrone Associates, Inc.: *See*—
Dodd, Jack G., Jr.; and Dodd, Jeffrey J., 4,678,913, Cl. 250-341.000.

Walter, Henry C., to Du Pont de Nemours, E. I., and Company. Process for preparing sulfur-modified chloroprene polymers. 4,678,848, Cl. 526-220.000.

Walter, Keith D.: *See*—
Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Rigsbee, Everett O., III; and Teener, Michael D., 4,679,191, Cl. 370-84.000.

Walton, Lewis A.: *See*—
King, Raymond A.; Larson, Jeffrey G.; and Walton, Lewis A., 4,678,630, Cl. 376-438.000.

Waltz, Marion D.: *See*—
Knapp, David J.; and Waltz, Marion D., 4,678,023, Cl. 164-452.000.

Wan, Chung-Zong; Dettling, Joseph C.; and Jagel, Kenneth I., to Engelhard Corporation. Three-way catalyst for lean exhaust systems. 4,678,770, Cl. 502-304.000.

Wang, Ju-Zhen, to Shanghai Lamp Factory. Process and usage of ceriated tungsten electrode material. 4,678,718, Cl. 428-560.000.

Wanngård, Johan C.: *See*—
Norell, Maria G.; and Wanngård, Johan C., 4,678,653, Cl. 423-478.000.

Ward, Michael A. V., to Combustion Electromagnetics, Inc. High efficiency voltage doubling ignition coil for CD system producing pulsed plasma type ignition. 4,677,960, Cl. 123-598.000.

Ward, Michael V.; and Cotter, Richard, to Baxter Travenol Laboratories, Inc. Rapid acting intravenous emulsions of omega-3 fatty acid esters. 4,678,808, Cl. 514-560.000.

Warner, James I. Riser assembly for a sub-surface irrigation and drainage system. 4,678,367, Cl. 405-39.000.

Warner-Lambert Company: *See*—
Jaen, Juan C.; and Wise, Lawrence D., 4,678,787, Cl. 514-253.000.
Taylor, Michael D.; and Badger, Edward W., 4,678,796, Cl. 514-356.000.

Warner, Robert T.: *See*—
Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., 4,678,450, Cl. 446-405.000.

Warren M. Jackson, Inc.: *See*—
Jackson, Warren M., 4,677,837, Cl. 72-88.000.

Warrior Corporation: *See*—
Scherbing, Frank J., deceased; and Scherbing, F. J., Jr., executor, 4,677,833, Cl. 70-68.000.

Washburn, Clyde, Jr., to Cincinnati Microwave, Inc. FM receiver. 4,679,247, Cl. 455-210.000.

Watabe, Akira: *See*—
Suzuki, Norio; Watabe, Akira; and Yamashita, Kazunari, 4,677,959, Cl. 123-587.000.

Watakabe, Yaichiro, to Mitsubishi Denki Kabushiki Kaisha. Photomask material. 4,678,714, Cl. 428-432.000.

Watanabe, Eiki: *See*—
Kitaoka, Takashi; and Watanabe, Eiki, 4,678,063, Cl. 187-119.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,678,315, Cl. 355-7.000.

Watanabe, Masaharu; and Ohe, Hiroaki, to Terumo Kabushiki Kaisha. Apparatus for separating proteins from blood plasma. 4,678,566, Cl. 210-143.000.

Watanabe, Masaki; Yamamoto, Hitoshi; Matsuoka, Yoshinori; and Tanaka, Kunihiko, to Honda Giken Kogyo Kabushiki Kaisha. Tiltable tricycle. 4,678,053, Cl. 180-210.000.

Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, to Solex Research Corporation of Japan. Crystallizer. 4,678,646, Cl. 422-245.000.

Watanabe, Nobuatsu: *See*—
Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, 4,678,646, Cl. 422-245.000.

Watanabe, Ryo: *See*—
Saeki, Osamu; Mori, Kenji; Onoda, Mamoru; Watanabe, Ryo; Shinohara, Katsufumi; Ashie, Takehiko; and Imanishi, Nobuyuki, 4,678,508, Cl. 75-26.000.

Watanabe, Shinobu: *See*—
Obayashi, Tsutomu; Watanabe, Shinobu; and Ino, Kazuhide, 4,678,681, Cl. 427-38.000.

Watanabe, Zensaku: *See*—
Chiyoma, Hitoshi; Watanabe, Zensaku; and Nakagawa, Masahiro, 4,679,088, Cl. 358-213.180.

Watari, Masafumi: *See*—
Ikedo, Masaru; Watari, Masafumi; Hayashi, Yoshiaki; Yamamoto, Osamu; and Tsutsu, Hiroshi, 4,678,275, Cl. 350-96.340.

Watts, Arun: *See*—
Bagaglio, Giancarlo; Assche, Jan V.; and Watts, Arun, 4,678,513, Cl. 106-38.220.

Waynick, William R.: *See*—
Shirey, Phillip G.; Rowe, David W.; and Waynick, William R., 4,678,027, Cl. 165-70.000.

Webasto-Werk W. Baier GmbH & Co: *See*—
Widemann, Friedrich; and Goerlich, Dieter, 4,678,431, Cl. 431-328.000.

Weber, Charles A., to Bock Products. End cap for a tubular member. 4,678,011, Cl. 138-96.00R.

Weber, Georg: *See*—
Kreuzer, Franz-Heinrich; Eidenschink, Rudolf; and Weber, Georg, 4,678,283, Cl. 350-340.000.

Weber-Stephen Products Co.: *See*—
Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, 4,677,964, Cl. 126-41.00R.

Weibye, Bjarne, to Apothekernes Laboratorium A.S. Apparatus for preparing quick cooking rice and vegetables. 4,677,907, Cl. 99-483.000.

Weider, John J.: *See*—
Konstant, Anthony N.; and Weider, John J., 4,678,091, Cl. 211-191.000.

Weil, Edward D.: *See*—
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Itoh, Kunio; Imai, Kiyoshi; Yoshida, Takeo; and Fukushima, Motoo, 4,678,827, Cl. 524-188.000.

Yoshida, Tomio; and Ohara, Shunji, to Matsushita Electric Industrial Co., Ltd. Optical recording and reproducing apparatus having erasing beam spot with asymmetrical intensity distribution. 4,679,184, Cl. 369-112.000.

Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, to Hitachi, Ltd. Process for producing zirconium-based alloy and the product thereof. 4,678,521, Cl. 148-11.50F.

Yoshigai Kikai Kinzoku Kabushiki Kaisha: *See*—
Yoshigai, Toshiharu, 4,678,349, Cl. 384-125.000.

Yoshigai, Toshiharu, to Yoshigai Kikai Kinzoku Kabushiki Kaisha. Bush used for bicycle brake device. 4,678,349, Cl. 384-125.000.

Yoshikawa, Yoshitaka; Tsukamoto, Masahide; Nishimura, Yutaka; Ono, Hitoshi; and Sano, Tetsuhiro, to Matsushita Electric Industrial Co., Ltd. Print head. 4,679,054, Cl. 346-76.0PH.

Yoshimura, Frederick T.: *See*—
Jensen, Tom M.; Yoshimura, Frederick T.; and Jensen, Deborah P., 4,678,202, Cl. 280-642.000.

Yoshimura, Hiroshi; and Hattori, Toshihiro, to Isuzu Motors Limited. Clutch control system with variable clutch connection position. 4,678,069, Cl. 192-0.033.

Yoshimura, Susumu; Kudoh, Yasuo; Tsuchiya, Soji; Kojima, Toshikuni; and Takahashi, Shohzoh, to Matsushita Electric Industrial Co., Ltd. Solid electrolytic capacitors. 4,679,124, Cl. 361-433.000.

Yoshimura, Yoshikazu: *See*—
Tanaka, Toshihide; Saka, Hiroshi; Yoshimura, Yoshikazu; and Shiomi, Yasuhumi, 4,679,249, Cl. 455-328.000.

Yoshinaka, Toshio; and Nagano, Syuji, to Toyota Jidosha Kabushiki Kaisha. Four-wheel vehicle drive system. 4,678,055, Cl. 180-247.000.

Yoshioka, Hiroshi: *See*—
Itoh, Kunio; Kozakai, Shohei; Hida, Yoshinori; Okinoshima, Hiroshige; Okada, Fumio; Oba, Toshio; Shimizu, Hisashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,678,688, Cl. 427-387.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Ao, Hideki; Obata, Minoru; and Inui, Jun, 4,678,785, Cl. 514-222.000.

Yoshiyagawa, Mitsugi: *See*—
Tamenori, Hiroyuki; Hattori, Akihiko; and Yoshiyagawa, Mitsugi, 4,678,652, Cl. 423-339.000.

Yoshizawa, Hideo, to Nippon Sheet Glass Co., Ltd. Glass shaping mold. 4,678,495, Cl. 65-287.000.

Yoshizawa, Kazuhiro: *See*—
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.

Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, to Kabushiki Kaisha Toshiba. Electrophotographic photosensitive member having barrier layer comprising microcrystalline silicon containing hydrogen. 4,678,731, Cl. 430-65.000.

Yoshizawa, Tamae; Otsuka, Kiyoto; Nagata, Shiro; and Takamatsu, Hideo, to Kuraray Company, Ltd. Method of producing a cyclized polydiene. 4,678,841, Cl. 525-353.000.

Yoshizumi, Seiichi: *See*—
Gotou, Shizuo; Kagimasa, Toyohiko; Yoshizumi, Seiichi; and Shintani, Yooichi, 4,679,140, Cl. 364-200.000.

Yosimura, Haruo: *See*—
Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegasi, Takasi; and Yamaoka, Isao, 4,677,934, Cl. 118-58.000.

Yotsutani, Akio: *See*—
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.

Young, Susan K.: *See*—
Cotter, Richard; Johnson, Robert C.; Rowe, W. Bruce; and Young, Susan K., 4,678,807, Cl. 514-552.000.

Young, William K., to T-Bar Incorporated. Cable organizing and protection system and method. 4,679,123, Cl. 361-428.000.

Yousina, Norio: *See*—
Osaki, Sigemi; Yousina, Norio; Morishita, Tsuyoshi; and Kawado, Yasuhumi, 4,678,633, Cl. 419-8.000.

Youtie, Robert K. Scroll type fluid displacement apparatus. 4,677,949, Cl. 123-235.000.

Ytter, Willy, to Extraversion, Inc. Display device. 4,678,246, Cl. 312-114.000.

Yu-Zhong, Liu, to North China Research Institute of Electro-Optics. Process for providing lithium tantalum oxide coated tantalum articles with improved wear resistance. 4,678,546, Cl. 204-32.100.

Yuan, Thomas C.: *See*—
Virkar, Anil; and Yuan, Thomas C., 4,678,761, Cl. 501-104.000.

Yuasa, Hiroyoshi; Yasuda, Akira; and Omura, Koichi, to Matsushita Electric Works, Ltd. Visual Image sensor system. 4,679,077, Cl. 358-108.000.

Zabunova, Orhideya B.: *See*—
Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.

Zahr, George E.: *See*—
Logullo, Francis M., Sr.; Wu, Yun-Tai; and Zahr, George E., 4,678,821, Cl. 523-205.000.

Zahuranec, Emery J.; and Musil, James C., to Crawford Fitting Co. Deburring tool. 4,678,380, Cl. 408-211.000.

Zajac, Patricia L.: *See*—
Elfman, Brian P.; and Zajac, Patricia L., 4,678,057, Cl. 180-272.000.

Zakraysek, Louis: *See*—
Belke, Robert E., Jr.; Shirk, Raymond A.; Lin, Hsiu H.; and Zakraysek, Louis, 4,679,122, Cl. 361-414.000.

Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. Sweetening with L-aminodicarboxylic acid amides. 4,678,674, Cl. 426-548.000.

Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. Sweetening with L-aminodicarboxylic acid alkenes. 4,678,675, Cl. 426-548.000.

Zarembo, Peter J., to Minnesota Mining and Manufacturing Company. Multi-sectional raceway. 4,677,799, Cl. 52-220.000.

Zartman, David L., to New Mexico State University Foundation. Intravaginal anchor. 4,677,967, Cl. 128-1.00R.

Zecman, Kenneth P. Die casting torch. 4,678,429, Cl. 431-144.000.

Zehnder, Beat: *See*—
Dorn, Franz; Pfiffner, Albert; and Zehnder, Beat, 4,678,790, Cl. 514-277.000.

Zehnder, Jurg: *See*—
Ritzl, Antal; and Zehnder, Jurg, 4,678,225, Cl. 296-181.000.

Zelasko, Joseph: *See*—
Newman, Lola; and Zelasko, Joseph, 4,678,150, Cl. 248-205.300.

Zelonka, Ronald A.: *See*—
Boivin, Daniel W.; and Zelonka, Ronald A., 4,678,834, Cl. 525-74.000.

Zeng, Sen: *See*—
Zhang, Yun-xiang; Dai, Xing-yi; Lu, Zhi-kang; and Zeng, Sen, 4,678,847, Cl. 526-206.000.

Zenith Electronics Corporation: *See*—
Prazak, Charles J., III, 4,678,447, Cl. 445-45.000.

ZF-Herion-Systemtechnik GmbH: *See*—
Dahlem, Wolfgang, 4,677,936, Cl. 118-307.000.

Zhang, Yun-xiang; Dai, Xing-yi; Lu, Zhi-kang; and Zeng, Sen, to Shanghai Institute of Organic Chemistry, Academia Sinica. Process for preparing a terpolymer of tetrafluoroethylene, ethylene and a third monomer. 4,678,847, Cl. 526-206.000.

Zibis, Peter: *See*—
Bulst, Wolf-Eckhart; Erthel, Mira; and Zibis, Peter, 4,679,014, Cl. 333-195.000.

Zimmer, C. D.: *See*—
Laing, John R.; Zimmer, C. D.; Maniar, Deepak R.; and Williams, Meurig W., 4,678,734, Cl. 430-137.000.

Zinger, William H.: *See*—
Irzinski, Edward P.; Krill, Jerry A.; and Zinger, William H., 4,679,008, Cl. 333-21.00R.

Zinpro Corporation: *See*—
Abdel-Monem, Mahmoud M., 4,678,854, Cl. 556-149.000.

Zomp, John M.: *See*—
Sherwin, Gary W.; and Zomp, John M., 4,679,002, Cl. 330-66.000.

501 Regents of the University of California: *See*—
Meares, Claude F.; DeNardo, Sally J.; Cole, William C.; and Mol, Min K., 4,678,667, Cl. 424-85.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ag-Con Materials of Nevada, Inc.: *See*—
Starbuck, Arthur E., Re. 32,454, Cl. 106-286.800.

Eli Lilly and Company: *See*—
Hamill, Robert L.; and Hoehn, Marvin M., Re. 32,455, Cl. 530-317.000.

Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. A-21978 antibiotics and process for their production. Re. 32,455, Cl. 530-317.000.

Hobbs, Arthur G., Jr.: *See*—
Proctor, Robert H.; and Hobbs, Arthur G., Jr., Re. 32,451, Cl. 62-149.000.

Hoehn, Marvin M.: *See*—
Hamill, Robert L.; and Hoehn, Marvin M., Re. 32,455, Cl. 530-317.000.

Ishii, Shiro, to M-S Corporation. Battery powered drawer opening device. Re. 32,456, Cl. 200-61.610.

M-S Corporation: *See*—
Ishii, Shiro, Re. 32,456, Cl. 200-61.610.

Matey, James R., to RCA Corporation. Scanning capacitance microscope. Re. 32,457, Cl. 369-58.000.

Murray Corporation: *See*—
Proctor, Robert H.; and Hobbs, Arthur G., Jr., Re. 32,451, Cl. 62-149.000.

Nikolich, Milovan, to Signode Corporation. Portable gas-powered tool with linear motor. Re. 32,452, Cl. 123-46.0SC.

Norman, Warren N.: *See*—
Stover, Don A.; Upshaw, Clarence W.; and Norman, Warren N., Re. 32,453, Cl. 280-33.99B.

Proctor, Robert H.; and Hobbs, Arthur G., Jr., to Murray Corporation. Weight-monitored air-conditioner charging station. Re. 32,451, Cl. 62-149.000.

Pure Fuel of Nevada, Inc.: *See*—
Starbuck, Arthur E., Re. 32,454, Cl. 106-286.800.

RCA Corporation: *See*—
Matey, James R., Re. 32,457, Cl. 369-58.000.

Signode Corporation: *See*—
Nikolich, Milovan, Re. 32,452, Cl. 123-46.0SC.

Starbuck, Arthur E., to Pure Fuel of Nevada, Inc.; and Ag-Con Materials of Nevada, Inc. Process for desulfurization of coal and ores. Re. 32,454, Cl. 106-286.800.

Stover, Don A.; Upshaw, Clarence W.; and Norman, Warren N., to UNR Industries, Inc. Shopping cart with baby seat. Re. 32,453, Cl. 280-33.99B.

UNR Industries, Inc.: *See*—
Stover, Don A.; Upshaw, Clarence W.; and Norman, Warren N., Re. 32,453, Cl. 280-33.99B.

Upshaw, Clarence W.: *See*—
Stover, Don A.; Upshaw, Clarence W.; and Norman, Warren N., Re. 32,453, Cl. 280-33.99B.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Auto Restraint Systems Limited: *See*—
Giffin, William McAlpin; Pollitt, John Michael; and Clifford, Roy, B1 4,040,645, Cl. 280-803.000.

Benasutti, John E.: *See*—
Griffin, Wendell L.; Carlsen, John; and Benasutti, John E., B1 4,257,674, Cl. 350-96.210.

Carlsen, John: *See*—
Griffin, Wendell L.; Carlsen, John; and Benasutti, John E., B1 4,257,674, Cl. 350-96.210.

Clifford, Roy: *See*—
Giffin, William McAlpin; Pollitt, John Michael; and Clifford, Roy, B1 4,040,645, Cl. 280-803.000.

Farmer, Diane B.: *See*—
Farmer, M. Zane; and Farmer, Diane B., B1 4,572,253, Cl. 141-95.000.

Farmer, M. Zane; and Farmer, Diane B. Automatic level sensing system. B1 4,572,253, 7-7-87, Cl. 141-95.000.

Giffin, William McAlpin; Pollitt, John Michael; and Clifford, Roy, to Auto Restraint Systems Limited. Seat-belt apparatus. B1 4,040,645, 7-7-87, Cl. 280-803.000.

Griffin, Wendell L.; Carlsen, John; and Benasutti, John E., to GTE Products Corporation. Elastomeric fiber optic splice. B1 4,257,674, 7-7-87, Cl. 350-96.210.

GTE Products Corporation: *See*—
Griffin, Wendell L.; Carlsen, John; and Benasutti, John E., B1 4,257,674, Cl. 350-96.210.

Haglund, William A.; and Reiling, Theodore P. Perennial weed control by deep placement of volatile soil fumigants. B1 3,964,405, 7-7-87, Cl. 111-6.000.

Kabushiki Kaisha Sunpak: *See*—
Kamon, Akio; Nagashima, Sakyo; and Tsuruta, Yuzo, B1 4,329,624, Cl. 315-151.000.

Kamon, Akio; Nagashima, Sakyo; and Tsuruta, Yuzo, to Kabushiki Kaisha Sunpak. Computer type electronic photoflash. B1 4,329,624, 7-7-87, Cl. 315-151.000.

Moehlenpah Industries, Inc.: *See*—
Moehlenpah, Walter G., B1 3,951,033, Cl. 411-468.000.

Moehlenpah, Walter G., to Moehlenpah Industries, Inc. Connector plate. B1 3,951,033, 7-7-87, Cl. 411-468.000.

Nagashima, Sakyo: *See*—
Kamon, Akio; Nagashima, Sakyo; and Tsuruta, Yuzo, B1 4,329,624, Cl. 315-151.000.

Pharmacia Aktiebolag: *See*—
Sjoquist, John A., B1 3,995,018, Cl. 435-7.000.

Pollitt, John Michael: *See*—
Giffin, William McAlpin; Pollitt, John Michael; and Clifford, Roy, B1 4,040,645, Cl. 280-803.000.

Reiling, Theodore P.: *See*—
Haglund, William A.; and Reiling, Theodore P., B1 3,964,405, Cl. 111-6.000.

S. C. Johnson & Son, Inc.: *See*—
Schmidt, Ronald E.; Schultz, Harold H.; and Wilson, Dennis M., B1 4,529,787, Cl. 526-209.000.

Schmidt, Ronald E.; Schultz, Harold H.; and Wilson, Dennis M., to S. C. Johnson & Son, Inc. Bulk polymerization process for preparing high solids and uniform copolymers. B1 4,529,787, 7-7-87, Cl. 526-209.000.

Schultz, Harold H.: *See*—
Schmidt, Ronald E.; Schultz, Harold H.; and Wilson, Dennis M., B1 4,529,787, Cl. 526-209.000.

Sjoquist, John A., to Pharmacia Aktiebolag. Method of binding immunoglobulin employing a polypeptide from microorganisms. B1 3,995,018, 7-7-87, Cl. 435-7.000.

Tsuruta, Yuzo: *See*—
Kamon, Akio; Nagashima, Sakyo; and Tsuruta, Yuzo, B1 4,329,624, Cl. 315-151.000.

Wilson, Dennis M.: *See*—
Schmidt, Ronald E.; Schultz, Harold H.; and Wilson, Dennis M., B1 4,529,787, Cl. 526-209.000.

LIST OF DESIGN PATENTEES

A.R.A. Manufacturing Company of Delaware, Inc.: *See*—
Tigner, Robert H.; and Richardson, Carl C., 290,747, Cl. D23-142.000.

Abbott, Jane C.: *See*—
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Aliberti, Alvino. Athletic goggles. 290,710, 7-7-87, Cl. D16-107.000.

Allen, Robert S.; Freeman, Richard G.; and Seabury, Thomas W., to Multisonics, Inc. Keyboard and display panel for intersection controller. 290,707, 7-7-87, Cl. D14-115.000.

Allflex International Limited: *See*—
Scott, Michael J., 290,775, Cl. D30-43.000.

American Telephone and Telegraph Company: *See*—
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.

Amity Leather Products Company: *See*—
Lund, Eric W.; and Young, Raymond W., 290,696, Cl. D19-11.000.

Andreas Hettich, Firma: *See*—
Eberle, Gunter, 290,749, Cl. D24-22.000.

Appel, Mel; and Kress, George, to Mel Appel Company, The. Carrier for coloring books and crayons. 290,661, 7-7-87, Cl. D3-73.000.

Apple Computer, Inc.: *See*—
Peart, Stephen; and Van-Dinh, Man, 290,706, Cl. D14-114.000.
Peart, Stephen; Willnauer, Sigmar; and Christensen, Terrence B., 290,716, Cl. D18-13.000.

Aqua-Leisure Industries, Inc.: *See*—
Berenson, Steven M., 290,764, Cl. D29-9.000.

Arita, Toyomi, to Sanyo Electric Co., Ltd. Electric shaver. 290,758, 7-7-87, Cl. D28-49.000.

AT&T Information Systems Inc.: *See*—
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.

Attwood Corporation: *See*—
Whitley, Warwick M., II, 290,744, Cl. D23-115.000.
Whitley, Warwick M., II, 290,745, Cl. D23-115.000.
Whitley, Warwick M., II, 290,746, Cl. D23-115.000.

B.P. Electronics, Inc.: *See*—
Rea, Arthur, 290,708, Cl. D16-14.000.

Basil, Vicki L.; and Palacios, Roma. Mirror. 290,662, 7-7-87, Cl. D6-310.000.

Berenson, Steven M., to Aqua-Leisure Industries, Inc. Aviator-style swim mask. 290,764, 7-7-87, Cl. D29-9.000.

Bertrand, Vic, to Ritvik Group Inc., The. Toy construction block. 290,720, 7-7-87, Cl. D21-108.000.

Biolectron, Inc.: *See*—
Montalbano, Anthony P.; and Conroy, David E., 290,751, Cl. D24-41.000.

Board, John R., to Samuel Smith Old Brewery. Bottle. 290,686, 7-7-87, Cl. D9-355.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., to Kenner Parker Toys Inc. Doll. 290,724, 7-7-87, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, to Kenner Parker Toys Inc. Doll. 290,725, 7-7-87, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, to Kenner Parker Toys Inc. Doll. 290,726, 7-7-87, Cl. D21-166.000.

Broadbent, Michael C.: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.

Buckhorn Material Handling Group Inc.: *See*—
Tabler, Charles P., 290,778, Cl. D34-40.000.

Burroughs Corporation: *See*—
Stern, Timothy R.; and Selepouchin, Vladimir, 290,702, Cl. D14-113.000.

Callahan, Anne E. Child restraint harness. 290,765, 7-7-87, Cl. D29-11.000.

Canady, Albert E. Buoy marker launcher. 290,731, 7-7-87, Cl. D22-113.000.

Cannon, Fleming V., Jr., to Dover Corporation. Hydraulic wrecker and boom housing. 290,692, 7-7-87, Cl. D12-14.000.

Canon Kabushiki Kaisha: *See*—
Omino, Seiichi; and Shimoyama, Noboru, 290,715, Cl. D18-12.000.
Yomo, Takashi, 290,705, Cl. D14-114.000.

Cassidy, Edward K.: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.

Chernikoff, Nelson N.: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.

Choi, Jong S., to Gold Star Company, Ltd. Microwave oven. 290,675, 7-7-87, Cl. D7-351.000.

Christensen, Terrence B.: *See*—
Peart, Stephen; Willnauer, Sigmar; and Christensen, Terrence B., 290,716, Cl. D18-13.000.

Comptoir Nouveau de la Parfumerie: *See*—
Llorente, Jacques, 290,687, Cl. D9-385.000.

Conroy, David E.: *See*—
Montalbano, Anthony P.; and Conroy, David E., 290,751, Cl. D24-41.000.

Convergent Technologies, Inc.: *See*—
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.

Coralline, William. Bingo chip bell. 290,691, 7-7-87, Cl. D10-116.000.

Costan S.p.A.: *See*—
De Zolt, Ivano, 290,667, Cl. D6-472.000.

Cozad, Cheryl L.: *See*—
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Creative Devices Research, Ltd.: *See*—
Holloway, Wynford, 290,719, Cl. D21-48.000.

Curtis Manufacturing Company, Inc.: *See*—
Judd, Thomas W., 290,717, Cl. D18-23.000.

Dacor Corporation: *See*—
Walsh, Mark L., 290,763, Cl. D29-9.000.

Daiwa Seiko Inc.: *See*—
Iinuma, Kanji, 290,733, Cl. D22-141.000.
Inoue, Koui, 290,752, Cl. D25-73.000.
Matsui, Yoshiyuki, 290,734, Cl. D22-142.000.
Matsui, Yoshiyuki, 290,735, Cl. D22-142.000.
Yamaguchi, Kaname, 290,732, Cl. D22-137.000.

Dartnall, Adrian, to Gordon Ellis & Company. Grab bar. 290,683, 7-7-87, Cl. D8-319.000.

Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., to American Telephone and Telegraph Company; AT&T Information Systems Inc.; and Convergent Technologies, Inc. Computer display terminal or similar article. 290,703, 7-7-87, Cl. D14-113.000.

De Zolt, Ivano, to Costan S.p.A. Chest freezer. 290,667, 7-7-87, Cl. D6-472.000.

DiCarlo, Paul; and Halt, John, to Xomed Inc. Surgical saw handpiece. 290,750, 7-7-87, Cl. D24-28.000.

Doodson, Peter J., to U.S. Philips Corporation. Video cassette recorder. 290,695, 7-7-87, Cl. D14-2.000.

Dover Corporation: *See*—
Cannon, Fleming V., Jr., 290,692, Cl. D12-14.000.

Duffek, Michael A. Combined cat house and platform. 290,767, 7-7-87, Cl. D30-1.000.

Eberle, Gunter, to Andreas Hettich, Firma. Centrifuge. 290,749, 7-7-87, Cl. D24-22.000.

Einhorn, Henry L. Inflatable club. 290,728, 7-7-87, Cl. D21-211.000.

Einhorn, Henry L. Inflatable club. 290,729, 7-7-87, Cl. D21-211.000.

Ekco Products, Inc.: *See*—
Tabler, Charles P., 290,778, Cl. D34-40.000.

Fairchild, Larry L., to Universal-Rundle Corporation. Sink sprayer. 290,741, 7-7-87, Cl. D23-35.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Blank for hexagonal tray. 290,689, 7-7-87, Cl. D9-433.000.

Freeman, Richard G.: *See*—
Allen, Robert S.; Freeman, Richard G.; and Seabury, Thomas W., 290,707, Cl. D14-115.000.

Freezinhot Bottle Co., Ltd.: *See*—
Hung, Kung C., 290,755, Cl. D26-42.000.

Fujitaki, Roy K.; and Fukushima, Hiroshi. Fluorescent light for recessed lighting or the like. 290,756, 7-7-87, Cl. D26-74.000.

Fukuichi, Tokuo, to Toyota Jidosha Kabushiki Kaisha. Front bumper for an automobile. 290,693, 7-7-87, Cl. D12-169.000.

Fukushima, Hiroshi: *See*—
Fujitaki, Roy K.; and Fukushima, Hiroshi, 290,756, Cl. D26-74.000.

Gillam, Paul A.: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.

Goberman, Janis, to L'Oreal, S.A. Compact. 290,760, 7-7-87, Cl. D28-83.000.

Goberman, Janis, to L'Oreal, S.A. Cosmetic compact. 290,761, 7-7-87, Cl. D28-83.000.

Gold Star Company, Ltd.: *See*—
Choi, Jong S., 290,675, Cl. D7-351.000.

Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, to Penn Plax Plastics, Inc. Shelf unit for aquariums. 290,768, 7-7-87, Cl. D30-12.000.

Goldman, Marvin: *See*—
Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, 290,768, Cl. D30-12.000.

Gompes, Simon: *See*—
Rylands, Patrick, 290,727, Cl. D21-173.000.

Gordon Ellis & Company: *See*—
Dartnall, Adrian, 290,683, Cl. D8-319.000.

Halt, John: *See*—
DiCarlo, Paul; and Halt, John, 290,750, Cl. D24-28.000.

Hamada, Masanori; Okada, Takao; Uchida, Takako; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Radio tuner. 290,701, 7-7-87, Cl. D14-68.000.

Hedrick, John D. Shoulder-stock scope and camera mount. 290,709, 7-7-87, Cl. D16-44.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Handle for a faucet. 290,736, 7-7-87, Cl. D23-28.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet handle. 290,737, 7-7-87, Cl. D23-29.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet handle. 290,738, 7-7-87, Cl. D23-29.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Head for a faucet handle. 290,739, 7-7-87, Cl. D23-29.000.

Holloway, Thomas F., to Risdon Corporation. Lipstick dispenser. 290,762, 7-7-87, Cl. D28-89.000.

Holloway, Wynford, to Creative Devices Research, Ltd. Computer joystick. 290,719, 7-7-87, Cl. D21-48.000.

Holthaus, Susan M.: *See*—
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Stabilizing arm for poultry watering units. 290,770, 7-7-87, Cl. D30-13.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Cage mounted poultry watering unit. 290,771, 7-7-87, Cl. D30-14.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Support bracket for a cage mounted poultry watering device or similar article. 290,772, 7-7-87, Cl. D30-14.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Combined support bracket and holder for a cage mounted watering unit. 290,774, 7-7-87, Cl. D30-14.000.

Houston, Herbert A. Shower curtain holder. 290,685, 7-7-87, Cl. D8-368.000.

Hung, Kung C., to Freezinhot Bottle Co., Ltd. Mini fluorescent lantern. 290,755, 7-7-87, Cl. D26-42.000.

Ideal Security Hardware Corporation: *See*—
Wildgen, Leo F., 290,684, Cl. D8-331.000.

Iinuma, Kanji, to Daiwa Seiko Inc. Fishing reel. 290,733, 7-7-87, Cl. D22-141.000.

Imatt, Alex. Bottle drainer rack. 290,673, 7-7-87, Cl. D7-70.000.

Inoue, Koui, to Daiwa Seiko, Inc. Synthetic resin tube. 290,752, 7-7-87, Cl. D25-73.000.

Interlego A.G.: *See*—
Kushner, Philip M., 290,722, Cl. D21-108.000.
Ryaa, Jan; and Poulsen, Ole V., 290,721, Cl. D21-108.000.

International Business Machines Corporation: *See*—
Schaum, David L.; and Taylor, Joseph P., 290,704, Cl. D14-113.000.

Janome Sewing Machine Co. Ltd.: *See*—
Uchida, Koji, 290,711, Cl. D15-69.000.

Johnson, Edna M.: *See*—
Johnson, James; and Johnson, Edna M., 290,678, Cl. D7-387.000.

Johnson, James; and Johnson, Edna M. Barbecue pit cover. 290,678, 7-7-87, Cl. D7-387.000.

Joseph, Jacob E. Support stand. 290,666, 7-7-87, Cl. D6-449.000.

Judd, Thomas W., to Curtis Manufacturing Company, Inc. Printer stand. 290,717, 7-7-87, Cl. D18-23.000.

Jung, Kwan S. Combined picnic table and barbeque grill. 290,663, 7-7-87, Cl. D6-337.000.

Kabushiki Kaisha Suiden: *See*—
Kawai, Yuzo, 290,748, Cl. D23-158.000.

Kaminski, Stephen H.: *See*—
Strousse, Babette L.; and Kaminski, Stephen H., 290,664, Cl. D6-361.000.

Katsuno, Akira: *See*—
Tanaka, Akio; and Katsuno, Akira, 290,697, Cl. D14-30.000.

Kawai, Yuzo, to Kabushiki Kaisha Suiden. Combined ceiling fan and light. 290,748, 7-7-87, Cl. D23-158.000.

Kenner Parker Toys Inc.: *See*—
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Kent Heating Limited: *See*—
Ord, Graeme J.; and Lockhart, Robert N., 290,743, Cl. D23-97.000.

Kira, Hiroshi. Lighting fixture. 290,754, 7-7-87, Cl. D26-24.000.

Kitamura, Akio, to Takara Co., Ltd. Reconfigurable toy vehicle. 290,723, 7-7-87, Cl. D21-150.000.

Knochner, Michael: *See*—
Stutzer, Franz A.; and Knochner, Michael, 290,676, Cl. D7-384.000.

Knocner, Michael: *See*—
Stutzer, Franz A.; and Knocner, Michael, 290,677, Cl. D7-384.000.

Koyo Electronics Industries Co., Ltd.: *See*—
Shimizu, Norio; and Watanabe, Yuichi, 290,694, Cl. D13-12.000.

Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Front panel for a bakery product container or similar article. 290,779, 7-7-87, Cl. D34-40.000.

Kress, George: *See*—
Appel, Mel; and Kress, George, 290,661, Cl. D3-73.000.

Kushner, Philip M., to Interlego A.G. Simulative toy construction element. 290,722, 7-7-87, Cl. D21-108.000.

Lacoux, Peter. Table. 290,669, 7-7-87, Cl. D6-488.000.

Lee, Peter P. Polish applicator mitt. 290,777, 7-7-87, Cl. D32-40.000.

Liethen, Frederic J. Bird feeder or similar article. 290,773, 7-7-87, Cl. D30-15.000.

Lindahl, Richard, to Televerket. Telephone set. 290,700, 7-7-87, Cl. D14-53.000.

Llorente, Jacques, to Comptoir Nouveau de la Parfumerie. Perfume bottle. 290,687, 7-7-87, Cl. D9-385.000.

Lockhart, Robert N.: *See*—
Ord, Graeme J.; and Lockhart, Robert N., 290,743, Cl. D23-97.000.

L'Oreal, S.A.: *See*—
Goberman, Janis, 290,760, Cl. D28-83.000.
Goberman, Janis, 290,761, Cl. D28-83.000.

Lund, Eric W.; and Young, Raymond W., to Amity Leather Products Company. Combined checkbook holder with timepiece. 290,696, 7-7-87, Cl. D19-11.000.

Lundell, Rolf: *See*—
Wallin, Rolf, 290,776, Cl. D32-17.000.

Lundy, Maureen E. Coffee table. 290,668, 7-7-87, Cl. D6-484.000.

M.T.D. Medical Technology and Development Ltd.: *See*—
Nilsson, Lars A. H., 290,753, Cl. D25-80.000.

Mann, John M.: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.

Masco Corporation of Indiana: *See*—
Hill, Charles P.; and Spangler, Anthony G., 290,736, Cl. D23-28.000.
Hill, Charles P.; and Spangler, Anthony G., 290,737, Cl. D23-29.000.
Hill, Charles P.; and Spangler, Anthony G., 290,738, Cl. D23-29.000.
Hill, Charles P.; and Spangler, Anthony G., 290,739, Cl. D23-29.000.

Matsui, Yoshiyuki, to Daiwa Seiko, Inc. Fishing rod. 290,734, 7-7-87, Cl. D22-142.000.

Matsui, Yoshiyuki, to Daiwa Seiko, Inc. Fishing rod. 290,735, 7-7-87, Cl. D22-142.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hamada, Masanori; Okada, Takao; Uchida, Takako; and Ohta, Kikuo, 290,701, Cl. D14-68.000.
Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,713, Cl. D18-1.000.
Miyamoto, Isshin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.

McDowell, James W. Seed scale. 290,690, 7-7-87, Cl. D10-90.000.

McSweeney, Andrea: *See*—
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.

Mel Appel Company, The: *See*—
Appel, Mel; and Kress, George, 290,661, Cl. D3-73.000.

Miggels, Stephen G.: *See*—
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.

Miroyama, Toshiya: *See*—
Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,713, Cl. D18-1.000.

Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, to Matsushita Electric Industrial Co., Ltd. Typewriter. 290,713, 7-7-87, Cl. D18-1.000.

Miyamoto, Isshin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, to Matsushita Electric Industrial Co., Ltd. Combined typewriter and graphmaker. 290,714, 7-7-87, Cl. D18-1.000.

Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., to National Can Corporation. Can. 290,688, 7-7-87, Cl. D9-398.000.

Montalbano, Anthony P.; and Conroy, David E., to Biolectron, Inc. Electrical body stimulator. 290,751, 7-7-87, Cl. D24-41.000.

Moran, Charles: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.

Moriyama, Toshiya: *See—*
Miyamoto, Isshin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.
Multisonics, Inc.: *See—*
Allen, Robert S.; Freeman, Richard G.; and Seabury, Thomas W., 290,707, Cl. D14-115.000.
Nagamatsu, Yasuo: *See—*
Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,713, Cl. D18-1.000.
Miyamoto, Isshin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.
Nakamura, Hitoshi; and Ohtsuji, Tetsuo, to Pioneer Electronic Corporation. Loudspeaker. 290,699, 7-7-87, Cl. D14-34.000.
Nathan, Walter; and Zucker, Armand S., to RTC Industries, Inc. Slide track for a dispenser for cans or bottles. 290,670, 7-7-87, Cl. D6-511.000.
National Can Corporation: *See—*
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.
Nilsson, Lars A. H., to M.T.D. Medical Technology and Development Ltd. Panel. 290,753, 7-7-87, Cl. D25-80.000.
Nuttall, Michael J.: *See—*
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.
Nyegaard, Ib: *See—*
Nyegaard, Kim D.; and Nyegaard, Ib, 290,718, Cl. D20-1.000.
Nyegaard, Kim D.; and Nyegaard, Ib. Vending machine. 290,718, 7-7-87, Cl. D20-1.000.
Ohta, Kikuo: *See—*
Hamada, Masanori; Okada, Takao; Uchida, Takako; and Ohta, Kikuo, 290,701, Cl. D14-68.000.
Ohtsuji, Tetsuo: *See—*
Nakamura, Hitoshi; and Ohtsuji, Tetsuo, 290,699, Cl. D14-34.000.
Okada, Takao: *See—*
Hamada, Masanori; Okada, Takao; Uchida, Takako; and Ohta, Kikuo, 290,701, Cl. D14-68.000.
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Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.
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Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.
Omino, Seiichi; and Shimoyama, Noboru, to Canon Kabushiki Kaisha. Ink ribbon cassette. 290,715, 7-7-87, Cl. D18-12.000.
Ord, Graeme J.; and Lockhart, Robert N., to Kent Heating Limited. Heating stove. 290,743, 7-7-87, Cl. D23-97.000.
Palacios, Roma: *See—*
Basil, Vicki L.; and Palacios, Roma, 290,662, Cl. D6-310.000.
Pearson, Stanley W. Combined tray and dart and coin holder. 290,672, 7-7-87, Cl. D6-552.000.
Peart, Stephen; and Van-Dinh, Man, to Apple Computer, Inc. Monitor stand. 290,706, 7-7-87, Cl. D14-114.000.
Peart, Stephen; Willnauer, Sigmar; and Christensen, Terrence B., to Apple Computer, Inc. Laser printer. 290,716, 7-7-87, Cl. D18-13.000.
Penn Plax Plastics, Inc.: *See—*
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Philips, Gerald: *See—*
Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, 290,768, Cl. D30-12.000.
Pierce, Alfred R., Jr. Forearm protector. 290,766, 7-7-87, Cl. D29-20.000.
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Poulsen, Ole V.: *See—*
Ryaa, Jan; and Poulsen, Ole V., 290,721, Cl. D21-108.000.
Price Pfister, Inc.: *See—*
Yost, Holly K., 290,740, Cl. D23-29.000.
Pudwill, Horst. Caulking gun. 290,681, 7-7-87, Cl. D8-14.100.
Rea, Arthur, to B.P. Electronics, Inc. Apparatus for converting movie films to video tape. 290,708, 7-7-87, Cl. D16-14.000.
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Tigner, Robert H.; and Richardson, Carl C., 290,747, Cl. D23-142.000.
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Ritvik Group Inc., The: *See—*
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Rogers, Jay J. Cork retriever. 290,682, 7-7-87, Cl. D8-42.000.
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Stutzer, Franz A.; and Knocner, Michael, 290,677, Cl. D7-384.000.
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Rylands, Patrick, to Gompes, Simon. Clown in a barrel figure. 290,727, 7-7-87, Cl. D21-173.000.
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Miyamoto, Isshin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.
Samsonite Corporation: *See—*
Strousse, Babette L.; and Kaminski, Stephen H., 290,664, Cl. D6-361.000.
Samuel Smith Old Brewery: *See—*
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Sanyo Electric Co., Ltd.: *See—*
Arita, Toyomi, 290,758, Cl. D28-49.000.
Schaum, David L.; and Taylor, Joseph P., to International Business Machines Corporation. CRT display monitor or similar article. 290,704, 7-7-87, Cl. D14-113.000.
Scott, Michael J., to Allflex International Limited. Ear tag. 290,775, 7-7-87, Cl. D30-43.000.
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Snodgrass, Warren H. Credenza. 290,665, 7-7-87, Cl. D6-446.000.
Solheim, Karsten. Golf club grip. 290,730, 7-7-87, Cl. D21-222.000.
Spangler, Anthony G.: *See—*
Hill, Charles P.; and Spangler, Anthony G., 290,736, Cl. D23-28.000.
Hill, Charles P.; and Spangler, Anthony G., 290,737, Cl. D23-29.000.
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Stern, Timothy R.; and Selepouchin, Vladimir, to Burroughs Corporation. Display terminal. 290,702, 7-7-87, Cl. D14-113.000.
Strousse, Babette L.; and Kaminski, Stephen H., to Samsonite Corporation. Chaise lounge. 290,664, 7-7-87, Cl. D6-361.000.
Stutzer, Franz A.; and Knochner, Michael, to Rowenta-Werke GmbH. Food processor. 290,676, 7-7-87, Cl. D7-384.000.
Stutzer, Franz A.; and Knocner, Michael, to Rowenta-Werke GmbH. Food processor. 290,677, 7-7-87, Cl. D7-384.000.

Stutzer, Franz A., to Rowenta-Werke GmbH. Lighter. 290,757, 7-7-87, Cl. D27-36.000.
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Tabler, Charles P., to Buckhorn Material Handling Group Inc.; and Ekco Products, Inc. Bakery basket. 290,778, 7-7-87, Cl. D34-40.000.
Takagi, You, to Pioneer Electronic Corporation. Loudspeaker. 290,698, 7-7-87, Cl. D14-30.000.
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Tanaka, Akio; and Katsuno, Akira, to Pioneer Electronic Corporation. Speaker. 290,697, 7-7-87, Cl. D14-30.000.
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Schaum, David L.; and Taylor, Joseph P., 290,704, Cl. D14-113.000.
Taylor, William D., to Rubbermaid Incorporated. Bird feeder. 290,769, 7-7-87, Cl. D30-13.000.
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Lindahl, Richard, 290,700, Cl. D14-53.000.
Thorpe, James E. Drain pan. 290,679, 7-7-87, Cl. D7-397.000.
Tigner, Robert H.; and Richardson, Carl C., to A.R.A. Manufacturing Company of Delaware, Inc. Housing for automotive air conditioner. 290,747, 7-7-87, Cl. D23-142.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Fukuichi, Tokuo, 290,693, Cl. D12-169.000.
Trabattoni, Roberto, to Trasi S.A. Case for cosmetic products. 290,759, 7-7-87, Cl. D28-83.000.
Traczyk, Edward S.: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shuhski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.
Trasi S.A.: *See*—
Trabattoni, Roberto, 290,759, Cl. D28-83.000.
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, to Valor Heating Limited. Gas fire. 290,742, 7-7-87, Cl. D23-97.000.
Uchida, Koji, to Janome Sewing Machine Co. Ltd. Sewing machine. 290,711, 7-7-87, Cl. D15-69.000.
Uchida, Takako: *See*—
Hamada, Masanori; Okada, Takao; Uchida, Takako; and Ohta, Kikuo, 290,701, Cl. D14-68.000.
U.S. Philips Corporation: *See*—
Doodson, Peter J., 290,695, Cl. D14-2.000.
Universal-Rundle Corporation: *See*—
Fairchild, Larry I., 290,741, Cl. D23-35.000.
Valor Heating Limited: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.
Valov, Jennifer. Floatable tray for beverage containers. 290,674, 7-7-87, Cl. D7-71.000.
Van-Dinh, Man: *See*—
Peart, Stephen; and Van-Dinh, Man, 290,706, Cl. D14-114.000.
Veness, Cathy L.: *See*—
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.
Wallin, Rolf, to Lundell, Rolf. Suction tool for removing tin during desoldering operation. 290,776, 7-7-87, Cl. D32-17.000.
Walsh, Mark L., to Dacor Corporation. Diving mask. 290,763, 7-7-87, Cl. D29-9.000.
Ware, R. Louis. Hydroponic wafer and wick therefor or similar article. 290,680, 7-7-87, Cl. D8-1.000.
Watanabe, Yuichi: *See*—
Shimizu, Norio; and Watanabe, Yuichi, 290,694, Cl. D13-12.000.
Westvaco Corporation: *See*—
Forbes, Hampton E., Jr., 290,689, Cl. D9-433.000.
Whitehouse, Donald: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.
Whitley, Warwick M., II, to Attwood Corporation. Venturi louvered vent. 290,744, 7-7-87, Cl. D23-115.000.
Whitley, Warwick M., II, to Attwood Corporation. Louvered boat vent. 290,745, 7-7-87, Cl. D23-115.000.
Whitley, Warwick M., II, to Attwood Corporation. Louvered vent for boats. 290,746, 7-7-87, Cl. D23-115.000.
Wildgen, Leo F., to Ideal Security Hardware Corporation. Door latch. 290,684, 7-7-87, Cl. D8-331.000.
Willnauer, Sigmar: *See*—
Peart, Stephen; Willnauer, Sigmar; and Christensen, Terrence B., 290,716, Cl. D18-13.000.
Wizen Industry Co., Ltd.: *See*—
Shis, Tom Y., 290,712, Cl. D16-6.000.
Wright, Peter: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.
Xomed Inc.: *See*—
DiCarlo, Paul; and Halt, John, 290,750, Cl. D24-28.000.
Yamaguchi, Kaname, to Daiwa Seiko, Inc. Fishing reel spool. 290,732, 7-7-87, Cl. D22-137.000.
Yomo, Takashi, to Canon Kabushiki Kaisha. ROM cartridge for laser beam printer. 290,705, 7-7-87, Cl. D14-114.000.
Yost, Holly K., to Price Pfister, Inc. Faucet handle. 290,740, 7-7-87, Cl. D23-29.000.
Young, Raymond W.: *See*—
Lund, Eric W.; and Young, Raymond W., 290,696, Cl. D19-11.000.
Ziggity Systems, Inc.: *See*—
Hostetler, Eldon, 290,770, Cl. D30-13.000.
Hostetler, Eldon, 290,771, Cl. D30-14.000.
Hostetler, Eldon, 290,772, Cl. D30-14.000.
Hostetler, Eldon, 290,774, Cl. D30-14.000.
Zucker, Armand S.: *See*—
Nathan, Walter; and Zucker, Armand S., 290,670, Cl. D6-511.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 7TH DAY OF JULY, 1987

A. E. Staley Manufacturing Company: *See*—
Malik, Arshad H.; and Cahn, Arno, H303, Cl. 514-85.000.

Aldred, Anthony T.: *See*—
Nevitt, Michael V.; Aldred, Anthony T.; and Chan, Sai-Kit, H302, Cl. 501-103.000.

Arai, Hajime: *See*—
Numazawa, Akio; Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, H295, Cl. 74-473.00R.

Bothe, Gregory R.: *See*—
Tutin, Michael B.; Pitman, Steven A.; and Bothe, Gregory R., H308, Cl. 342-4.000.

Cahn, Arno: *See*—
Malik, Arshad H.; and Cahn, Arno, H303, Cl. 514-85.000.

Carver, James G.: *See*—
Ducote, Marjorie E.; and Carver, James G., H306, Cl. 558-452.000.

Chan, Sai-Kit: *See*—
Nevitt, Michael V.; Aldred, Anthony T.; and Chan, Sai-Kit, H302, Cl. 501-103.000.

Clark, Lee K.: *See*—
Epure, Stefan T., deceased; Clark, Lee K.; and Haine, James P., H307, Cl. 174-52.0PE.

Ducote, Marjorie E.; and Carver, James G., to United States of America, Army. Method for preparation of amine salt bonding agents. H306, 7-7-87, Cl. 558-452.000.

Edlin, George R.: *See*—
Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., H311, Cl. 372-9.000.

Epure, Gertrude M., executrix: *See*—
Epure, Stefan T., deceased; Clark, Lee K.; and Haine, James P., H307, Cl. 174-52.0PE.

Epure, Stefan T., deceased (by Epure, Gertrude M., executrix); Clark, Lee K.; and Haine, James P., to United States of America, Army. High "G" electronics system. H307, 7-7-87, Cl. 174-52.0PE.

Haga, Shozi: *See*—
Numazawa, Akio; Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, H295, Cl. 74-473.00R.

Haine, James P.: *See*—
Epure, Stefan T., deceased; Clark, Lee K.; and Haine, James P., H307, Cl. 174-52.0PE.

Hearst, Peter J., to United States of America, Navy. Stripping agent for chemically resistant coatings. H300, 7-7-87, Cl. 134-22.190.

Hiraizumi, Junichi; and Nagashima, Akira, to Kioritz Corporation. Saw chain guide device for chain saw. H294, 7-7-87, Cl. 30-383.000.

Johnson, William V., to United States of America, Navy. Analog multiplexer. H310, 7-7-87, Cl. 370-114.000.

Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., to United States of America, Army. Compensated laser resonant fluorescence beam sensing device for neutral particle beams. H311, 7-7-87, Cl. 372-9.000.

Kioritz Corporation: *See*—
Hiraizumi, Junichi; and Nagashima, Akira, H294, Cl. 30-383.000.

Liedl, Gerald L.: *See*—
Staudenmann, Jean-Louis; and Liedl, Gerald L., H313, Cl. 378-81.000.

Malik, Arshad H.; and Cahn, Arno, to A. E. Staley Manufacturing Company. Glycoside-containing agricultural treatment composition. H303, 7-7-87, Cl. 514-85.000.

Melvin, William S.: *See*—
Mitchell, Porter H.; and Melvin, William S., H305, Cl. 556-143.000.

Milberger, Walter E., to United States of America, Army. Energy recoverable choke feed. H309, 7-7-87, Cl. 363-124.000.

Miller, Walter E., Jr., to United States of America, Army. Covert beam projector. H299, 7-7-87, Cl. 244-3.130.

Mitchell, Porter H.; and Melvin, William S., to United States of America, Army. Demilitarization of high burn rate propellants containing ferrocene or its derivatives. H305, 7-7-87, Cl. 556-143.000.

Moorhead, Arthur J., to United States of America, Energy. Oxidation resistant filler metals for direct brazing of structural ceramics. H298, 7-7-87, Cl. 228-263.190.

Moorhead, Arthur J., to United States of America, Energy. Oxidation resistant filler metals for direct brazing of structural ceramics. H301, 7-7-87, Cl. 428-627.000.

Nagashima, Akira: *See*—
Hiraizumi, Junichi; and Nagashima, Akira, H294, Cl. 30-383.000.

Nevitt, Michael V.; Aldred, Anthony T.; and Chan, Sai-Kit, to United States of America, Energy. Ceramics containing dispersants for improved fracture toughness. H302, 7-7-87, Cl. 501-103.000.

Niaura, Vitas: *See*—
Vorrier, Robert J.; and Niaura, Vitas, H304, Cl. 522-92.000.

Nozaki, Tadashi: *See*—
Numazawa, Akio; Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, H295, Cl. 74-473.00R.

Numazawa, Akio; Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Shift fork support structure in a manual transmission. H295, 7-7-87, Cl. 74-473.00R.

Parker, Todd S. Rotating anode X-ray tube. H312, 7-7-87, Cl. 378-127.000.

Pitman, Steven A.: *See*—
Tutin, Michael B.; Pitman, Steven A.; and Bothe, Gregory R., H308, Cl. 342-4.000.

Roberts, Thomas G.: *See*—
Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., H311, Cl. 372-9.000.

Schultz, Edwin R., to United States of America, Air Force. Robotic refueling system for tactical and strategic aircraft. H297, 7-7-87, Cl. 141-232.000.

Staudenmann, Jean-Louis; and Liedl, Gerald L., to United States of America, Energy. Monochromator for continuous spectrum x-ray radiation. H313, 7-7-87, Cl. 378-81.000.

Strickland, Brian R.: *See*—
Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., H311, Cl. 372-9.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Numazawa, Akio; Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, H295, Cl. 74-473.00R.

Tutin, Michael B.; Pitman, Steven A.; and Bothe, Gregory R., to United States of America, Air Force. Fabric visual/infrared/radar decoys. H308, 7-7-87, Cl. 342-4.000.

United States of America
Air Force: *See*—
Schultz, Edwin R., H297, Cl. 141-232.000.
Tutin, Michael B.; Pitman, Steven A.; and Bothe, Gregory R., H308, Cl. 342-4.000.
Army: *See*—
Ducote, Marjorie E.; and Carver, James G., H306, Cl. 558-452.000.
Epure, Stefan T., deceased; Clark, Lee K.; and Haine, James P., H307, Cl. 174-52.0PE.
Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., H311, Cl. 372-9.000.
Milberger, Walter E., H309, Cl. 363-124.000.
Miller, Walter E., Jr., H299, Cl. 244-3.130.
Mitchell, Porter H.; and Melvin, William S., H305, Cl. 556-143.000.
Zabel, Patrick H., H296, Cl. 102-521.000.
Energy: *See*—
Moorhead, Arthur J., H298, Cl. 228-263.190.
Moorhead, Arthur J., H301, Cl. 428-627.000.
Nevitt, Michael V.; Aldred, Anthony T.; and Chan, Sai-Kit, H302, Cl. 501-103.000.
Staudenmann, Jean-Louis; and Liedl, Gerald L., H313, Cl. 378-81.000.
Navy: *See*—
Hearst, Peter J., H300, Cl. 134-22.190.
Johnson, William V., H310, Cl. 370-114.000.

Viskase Corporation: *See*—
Vorrier, Robert J.; and Niaura, Vitas, H304, Cl. 522-92.000.

Vorrier, Robert J.; and Niaura, Vitas, to Viskase Corporation. Printing ink for use on flexible films. H304, 7-7-87, Cl. 522-92.000.

Zabel, Patrick H., to United States of America, Army. Elastic puller sabot for small caliber flechette. H296, 7-7-87, Cl. 102-521.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 7, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

9	4,677,694
79	4,677,695
84	4,677,696
159	4,677,697
161 A	4,677,698
221	4,677,699

CLASS 5

90	4,677,700
447	4,677,701

CLASS 7

107	4,677,702

CLASS 8

480	4,678,473
543	4,678,474
606	4,678,475
639	4,678,476

CLASS 10

9	4,677,703

CLASS 15

1.5 R	4,677,704
398	4,677,705

CLASS 16

35 R	4,677,706
239	4,677,707
334	4,677,708

CLASS 17

11	4,677,709

CLASS 19

218	4,677,710

CLASS 23

305 A	4,678,477

CLASS 24

200	4,677,711
274 R	4,677,712
590	4,677,713
	4,677,714
637	4,677,715
641	4,677,716

CLASS 26

18.5	4,677,717

CLASS 29

33 P	4,677,718
40	4,677,719
148.4 C	4,677,720
149.5 S	4,677,721
156.5 A	4,677,722
157.1 R	4,677,723
157.3 R	4,677,724
280	4,677,725
401.1	4,677,726
402.06	4,677,727
407	4,678,924
415	4,677,728
426.5	4,677,729
512	4,677,730
526 R	4,677,731
563	4,677,732
	4,677,733
564.2	4,677,734
571	4,677,735
	4,677,736
	4,677,737
572	4,677,738
576 B	4,677,739
	4,677,740
588	4,677,741
591	4,677,742
596	4,677,743
729	4,677,744
741	4,677,745

CLASS 30

122	4,677,746
124	4,677,747
250	4,677,748
355	4,677,749
376	4,677,750

CLASS 33

128	4,677,752
143 M	4,677,751
264	4,677,753
361	4,677,754
503	4,677,755
514	4,677,756

CLASS 34

4	4,677,757
58	4,677,758
	4,677,759
90	4,677,760
108	4,677,761
114	4,677,762
116	4,677,763
195	4,677,764

CLASS 36

1.5	4,677,765
43	4,677,766
102	4,677,767
117	4,677,768
	4,677,769
120	4,677,770
	4,677,771

CLASS 37

103	4,677,772

CLASS 38

44	4,677,773
77.83	4,677,774
102.2	4,677,775

CLASS 40

15 R	4,677,776
460	4,677,777
476	4,677,778
514	4,677,779
600	4,677,780

CLASS 42

70.01	4,677,781
100	4,677,782

CLASS 43

15	4,677,783
16	4,677,784
55	4,677,785
82	4,677,786

CLASS 44

1 SR	4,678,478
57	4,678,479

CLASS 46

76 PH	4,679,055

CLASS 47

1.5	4,677,787
47	4,677,788

CLASS 48

197 R	4,678,480

CLASS 49

56	4,677,789
462	4,677,790
463	4,677,791

CLASS 51

168	4,677,792
251	4,677,793

CLASS 52

36	4,677,794
63	4,677,795
73	4,677,796
94	4,677,797
106	4,677,798
220	4,677,799
309.12	4,677,800
389	4,677,801
488	4,677,802
646	4,677,803
648	4,677,804
	4,677,805
656	4,677,806

CLASS 53

118	4,677,807
238	4,677,808
427	4,677,809
428	4,677,810
456	4,677,811
477	4,677,812

CLASS 55

4	4,678,481
71	4,678,482
97	4,678,483
112	4,678,484
255	4,678,485
374	4,678,486
385 A	4,678,487
406	4,678,488
418	4,678,489

CLASS 56

13.9	4,677,813
15.6	4,677,814

CLASS 57

59	4,677,816
125	4,677,817
224	4,677,818
264	4,677,819
401	4,677,815
	4,677,820

CLASS 60

39.02	4,677,821
	4,677,829
39.23	4,677,822
274	4,677,823
521	4,677,824
525	4,677,825
602	4,677,826
648	4,677,827
751	4,677,828

CLASS 62

126	4,677,830
149	Re.32,451

CLASS 65

14	4,678,490
27	4,678,491
74	4,678,492
134	4,678,493
261	4,678,494
287	4,678,495

CLASS 66

84 A	4,577,831

CLASS 70

67	4,677,832
68	4,677,833
279	4,677,834
456 R	4,677,835

CLASS 71

76	4,678,496
86	4,678,497
87	4,678,498
90	4,678,499
92	4,678,500
	4,678,501
93	4,678,502
	4,678,503
94	4,678,504
	4,678,509

CLASS 72

88	4,677,836
	4,677,837
254	4,677,838
402	4,677,839
465	4,677,840

CLASS 73

30	4,677,841
32 A	4,677,842
54	4,677,843
55	4,677,844
56	4,677,845
63	4,677,846
64	4,677,847
146	4,677,848
155	4,677,849
204	4,677,850
434	4,677,851
628	4,677,852
644	4,677,853
794	4,677,854
799	4,677,855
850	4,677,856
855	4,677,857
861.65	4,677,858
861.72	4,677,859
862.48	4,677,860
862.54	4,677,861
862.65	4,677,862
863.12	4,677,863
863.51	4,677,864
866.5	4,677,865

CLASS 74

15.86	4,677,866
332	4,677,867
359	4,677,868
424.8 R	4,677,869
431	4,677,870
467	4,677,871
551.9	4,677,872
665 GC	4,677,874
665 GE	4,677,873
695	4,677,875
715	4,677,876
785	4,677,877
861	4,677,878
866	4,677,879
	4,677,880

CLASS 75

0.5 A	4,678,505
10.25	4,678,506
24	4,678,507
26	4,678,508
244	4,678,510
251	4,678,511

CLASS 76

25 A	4,677,881
77	4,677,882

CLASS 81

3.37	4,677,883

CLASS 82

4 C	4,677,884
40 R	4,677,885
53	4,677,886

CLASS 83

788	4,677,887
862	4,677,888

CLASS 84

1.01	4,677,889
1.19	4,677,890
313	4,677,891
405	4,677,892
473	4,677,893

CLASS 86

45	4,677,894

CLASS 89

8	4,677,895
36.08	4,677,896
166	4,677,897
187.01	4,677,898

CLASS 91

403	4,677,899

CLASS 92

212	4,677,900
213	4,677,901

CLASS 98

2.11	4,677,902
31	4,677,903
38.1	4,677,904

CLASS 99

413	4,677,905
450	4,677,906
483	4,677,907

CLASS 100

53	4,677,908
229	4,677,909

CLASS 101

93.01	4,677,910
218	4,677,911
365	4,677,912

CLASS 102

215	4,677,913
233	4,677,914
517	4,677,915

CLASS 104

118	4,677,916

CLASS 105

248	4,677,917
378	4,677,918

CLASS 106

18.32	4,678,512
38.22	4,678,513
100	4,678,514
111	4,678,515
197.1	4,678,516
286.8	Re.32,454
309	4,678,517

CLASS 108

63	4,677,919
69	4,677,920

CLASS 111

6	4,677,921
	B1 3,964,405
52	4,677,922

CLASS 112

104	4,677,923
258	4,677,924
266.1	4,677,925
274	4,677,926
455	4,677,927

CLASS 114

39	4,677,928
211	4,677,929
230	4,677,930
331	4,677,931

CLASS 116

35 R	4,677,932
313	4,677,933

CLASS 118

58	4,677,934
108	4,677,935
307	4,677,936
500	4,677,937

CLASS 119

29	4,677,938

CLASS 122

17	4,677,939

CLASS 123

2	4,677,940
41.12	4,677,941
41.21	4,677,942
41.27	4,677,943
46 SC	Re.32,452
73 B	4,677,944
90.48	4,677,945
146.5 A	4,677,946
192 B	4,677,948
195 C	4,677,947
235	4,677,949
241	4,677,950
357	4,677,951
372	4,677,952
450	4,677,953
478	4,677,954
489	4,677,955
520	4,677,956
572	4,677,957
585	4,677,958
587	4,677,959
598	4,677,960

CLASS 125

11 CD	4,677,962
15	4,677,963

CLASS 126

41 R	4,677,964
76	4,677,965
450	4,677,966

CLASS 128

1 R	4,677,967
	4,677,968
75	4,677,969
82.1	4,677,970
87 R	4,677,971
92 V	4,677,972
92 VW	4,677,973
163	4,677,974
200.14	4,677,975
201.25	4,677,976
206.24	4,677,977
207.14	4,677,978
314	4,677,979
655	4,677,980
660	4,677,981
664	4,677,982
680	4,677,983
681	4,677,984
691	4,677,985
697	4,677,986
719	4,677,987
736	4,677,988
784	4,677,989
786	4,677,990

CLASS 130

27 AE	4,677,991

CLASS 131

209	4,677,992
280	4,677,993
310	4,677,994
335	4,677,995
336	4,677,996

CLASS 134

167 C	4,677,997
181	4,677,998

CLASS 135

117	4,677,999

CLASS 137

1	4,678,000
194	4,678,001
315	4,678,002
382	4,678,003
469	4,678,004
499	4,678,005
596.17	4,678,006
625.66	4,678,007
630.12	4,678,008
818	4,678,009

CLASS 138

31	4,678,010
96 R	4,678,011

CLASS 139

1 C	4,678,012
384 B	4,678,013

CLASS 141

67	4,678,014
95	B1 4,572,253
131	4,678,015

CLASS 147

48	4,678,016

CLASS 148

6.15 Z	4,678,519
6.2	4,678,518
6.35	4,678,520
11.5 F	4,678,521
12 C	4,678,522
325	4,678,523

CLASS 149

21	4,678,524

CLASS 152

416	4,678,017

CLASS 156

73.1	4,678,525
195	4,678,526
213	4,678,527
220	4,678,528
234	4,678,529
245	4,678,530
250	4,678,531
314	4,678,532
435	4,678,533
607	4,678,534
623 R	4,678,535
635	4,678,536
643	4,678,537
	4,678,538
	4,678,539
	4,678,540

659.1 4,678,542
664 4,678,541

CLASS 160

135 4,678,018
272 4,678,019

CLASS 164

16 4,678,020
40 4,678,021
416 4,678,022
452 4,678,023
503 4,678,024

CLASS 165

12 4,678,025
67 4,678,026
70 4,678,027
72 4,678,028
133 4,678,029
166 4,678,030

CLASS 166

242 4,678,031
246 4,678,033
248 4,678,034
250 4,678,035
273 4,678,036
295 4,678,032
299 4,678,037
301 4,678,038
303 4,678,039
370 4,678,040

CLASS 169

24 4,678,041

CLASS 172

15 4,678,042
349 4,678,043

CLASS 174

35 GC 4,678,863
36 4,678,864
4,678,865
88 R 4,678,866
135 4,678,867
152 GM 4,678,868

CLASS 175

4.52 4,678,044
61 4,678,045

CLASS 177

1 4,678,046
4,678,047
212 4,678,048
229 4,678,049
4,678,050

CLASS 178

19 4,678,869
4,678,870

CLASS 180

9.1 4,678,051
143 4,678,052
210 4,678,053
225 4,678,054
247 4,678,055
4,678,056
272 4,678,057
273 4,678,058

CLASS 182

5 4,678,059
160 4,678,060
206 4,678,061

CLASS 187

1 R 4,678,062
119 4,678,063

CLASS 188

73.45 4,678,064
196 D 4,678,065
218 A 4,678,066
328 4,678,067
353 4,678,068

CLASS 192

0.033 4,678,069
58 B 4,678,070
70.27 4,678,071

CLASS 194

206 4,678,072

CLASS 198

396 4,678,073
457 4,678,074
496 4,678,075
525 4,678,076
803.01 4,678,077
803.2 4,678,078

CLASS 200

1 V 4,678,871
5 R 4,678,872
18 4,678,873
43.12 4,678,874
61.54 4,678,875
61.61 Re.32,456
148 A 4,678,878
148 F 4,678,877
148 R 4,678,876
295 4,678,879
340 4,678,880

CLASS 202

154 4,678,543

CLASS 203

95 4,678,544

CLASS 204

15 4,678,545
32.1 4,678,546
37.1 4,678,547
67 4,678,548
74 4,678,549
105 R 4,678,550
129.75 4,678,551
146 4,678,552
182.6 4,678,553
299 R 4,678,554

CLASS 206

279 4,678,079
387 4,678,080
4,678,081
459 4,678,082
4,678,083
597 4,678,084

CLASS 208

36 4,678,555
96 4,678,556
112 4,678,557
390 4,678,558

CLASS 209

17 4,678,559
23 4,678,560
166 4,678,561
4,678,562
4,678,563

CLASS 210

108 4,678,564
110 4,678,565
143 4,678,566
150 4,678,567
4,678,582
169 4,678,568
187 4,678,569
198.2 4,678,570
202 4,678,571
232 4,678,572
321.1 4,678,573
327 4,678,574
4,678,575
433.2 4,678,576
441 4,678,577
445 4,678,578
477 4,678,579
490 4,678,580
500.23 4,678,581
638 4,678,583
719 4,678,584
727 4,678,585
743 4,678,586
748 4,678,587
788 4,678,588
797 4,678,589

CLASS 211

28 4,678,085
47 4,678,086
70.5 4,678,087
73 4,678,088
133 4,678,089
150 4,678,090
191 4,678,091

CLASS 215

11 E 4,678,092
11 R 4,678,093
256 4,678,094

CLASS 219

10.51 4,678,881
10.55 E 4,678,882
10.61 R 4,678,883
69 C 4,678,885
69 P 4,678,884
85 R 4,678,886
117.1 4,678,887
121 L 4,678,890
121 LJ 4,678,889
4,678,891
121 PW 4,678,888
272 4,678,892

CLASS 220

4 F 4,678,095
273 4,678,096
288 4,678,097
289 4,678,098

CLASS 221

48 4,678,099

CLASS 222

52 4,678,100
82 4,678,101
130 4,678,103
146.6 4,678,104
153 4,678,105
162 4,678,106
181 4,678,102
386.5 4,678,107

CLASS 224

274 4,678,108

CLASS 226

74 4,678,109

CLASS 228

4.1 4,678,110
37 4,678,111
138 4,678,112
160 4,678,113
176 4,678,114
183 4,678,115

CLASS 230

201 4,678,899

CLASS 235

70 R 4,678,893
375 4,678,894
379 4,678,895
380 4,678,896
436 4,678,897
468 4,678,898

CLASS 236

25 A 4,678,116
92 A 4,678,117

CLASS 237

12.3 B 4,678,118

CLASS 239

9 4,678,119
75 4,678,120
333 4,678,122
464 4,678,123
585 4,678,124
589.1 4,678,125

CLASS 241

34 4,678,126
46.04 4,678,127
101 A 4,678,128
101.7 4,678,129
222 4,678,130
293 4,678,131

CLASS 242

47.09 4,678,132
56 A 4,678,133
107.4 A 4,678,134
117 4,678,135
131 4,678,136
192 4,678,137
198 4,678,138
199 4,678,139
4,678,140

CLASS 244

2 4,678,141
3.16 4,678,142
63 4,678,143
134 R 4,678,144
152 4,678,145

CLASS 248

56 4,678,146
74.1 4,678,147
122 4,678,148
150 4,678,149
205.3 4,678,150
220.2 4,678,151
225.1 4,678,152
229 4,678,153
311.2 4,678,154
564 4,678,155

CLASS 249

34 4,678,156
65 4,678,157
161 4,678,158

CLASS 250

205 4,678,900
223 R 4,678,901
227 4,678,902
4,678,903
4,678,904
4,678,905
4,678,906
231 P 4,678,909
231 SE 4,678,907
4,678,908
237 G 4,678,910
253 4,678,911
328 4,678,912
341 4,678,913
343 4,678,914
358.1 4,678,915
370 4,678,916
373 4,678,917
374 4,678,918
491.1 4,678,919
560 4,678,920
574 4,678,921

CLASS 251

107 4,678,159
129.02 4,678,160
171 4,678,161

CLASS 252

8.514 4,678,591
8.8 4,678,590
25 4,678,592
100 4,678,597
131 4,678,593
174.17 4,678,595
4,678,598
174.24 4,678,596
186.31 4,678,594
343 4,678,599
373 4,678,600
500 4,678,601
513 4,678,602
522 R 4,678,603
4,678,604
542 4,678,606
547 4,678,605
609 4,678,607
700 4,678,608

CLASS 254

50.2 4,678,163
93 H 4,678,164
97 4,678,165

CLASS 256

13.1 4,678,166

CLASS 259

8 B 4,678,162

CLASS 260

349 4,678,610
391 4,678,613
397.45 4,678,609
510 4,678,611
543 R 4,678,612
665 R 4,678,614

CLASS 261

111 4,678,615

CLASS 264

24 4,678,616
25 4,678,617

CLASS 266

165 4,678,167
196 4,678,168

CLASS 269

46 4,678,169
296 4,678,170
325 4,678,171

CLASS 270

18 4,678,172
45 4,678,173
54 4,678,174

CLASS 271

34 4,678,175
94 4,678,176
238 4,678,177
242 4,678,178
295 4,678,179
296 4,678,180

CLASS 272

68 4,678,181
73 4,678,182
97 4,678,183
129 4,678,184
134 4,678,185
4,678,186
144 4,678,187

CLASS 273

1 R 4,678,188
1.5 A 4,678,189
146 4,678,190
4,678,191
157 R 4,678,192
186 C 4,678,193
373 4,678,194

CLASS 280

33.99 A 4,678,195
33.99 B Re.32,453
47.41 4,678,196
80 R 4,678,197
153 A 4,678,198
491 E 4,678,199
607 4,678,200
620 4,678,201
642 4,678,202
707 4,678,203
710 4,678,204
803 B1 4,040,645
808 4,678,205

CLASS 281

15 B 4,678,206

CLASS 285

39 4,678,207
112 4,678,208
144 4,678,209
318 4,678,210
368 4,678,211

CLASS 290

54 4,678,922
55 4,678,923

CLASS 292

7 4,678,212
37 4,678,213
213 4,678,214
247 4,678,215
256.69 4,678,216

CLASS 294

16 4,678,217
4,678,218
82.33 4,678,219
118 4,678,220
170 4,678,221

CLASS 296

78 A 4,678,222
78.1 4,678,223
91 4,678,224
181 4,678,225
203 4,678,226
213 4,678,227
216 4,678,228

CLASS 297

68 4,678,229
284 4,678,230
329 4,678,231
408 4,678,232
429 4,678,233
439 4,678,234

CLASS 298

23 DF 4,678,235

CLASS 299

1 4,678,236
79 4,678,237
81 4,678,238

CLASS 301

37 N 4,678,239

CLASS 303

6 C 4,678,240
33 4,678,241
92 4,678,242
114 4,678,243

CLASS 305

57 4,678,244

CLASS 307

10 LS 4,678,925
10 SB 4,678,928
11 4,678,926
104 4,678,927
112 4,678,929
141 4,678,930
254 4,678,933
279 4,678,934
297 4,678,935
303 4,678,936
311 4,678,937
4,678,938
445 4,678,939
446 4,678,940
449 4,678,941
455 4,678,942
473 4,678,943
475 4,678,944
476 4,678,945
490 4,678,946
4,678,947
511 4,678,948
527 4,678,949
550 4,678,950
633 4,678,932

CLASS 310

13 4,678,951
83 4,678,952
91 4,678,953
156 4,678,954
201 4,678,931
323 4,678,956
328 4,678,955
332 4,678,957

CLASS 312

15 4,678,245
114 4,678,246
116 4,678,247

CLASS 313

15 4,678,958
17 4,678,959
25 4,678,960
36 4,678,961
383 4,678,962
405 4,678,963
414 4,678,964
451 4,678,965
487 4,678,966
497 4,678,967

CLASS 315

151 B1 4,329,624
290 4,678,968
382 4,678,969
397 4,678,970
399 4,679,211

CLASS 318

135 4,678,971
254 4,678,972
4,678,973
4,678,974
266 4,678,975
577 4,678,976
601 4,678,977
690 4,678,978
696 4,678,979
759 4,678,980
805 4,678,248

CLASS 320

2 4,678,981

CLASS 322

8 4,678,982

CLASS 323

222 4,678,983
285 4,678,984
324 4,678,985
343 4,678,986

CLASS 324

77 R 4,678,987
158 D 4,678,989
158 MG 4,678,990
158 R 4,678,988
207 4,678,991
208 4,678,992
4,678,993
236 4,678,994
309 4,678,995
4,678,996
341 4,678,997
427 4,678,998
4,678,999
428 4,679,000

CLASS 328

167 4,679,001

CLASS 330

66 4,679,002

CLASS 331

1 A 4,679,003
14 4,679,004
16 4,679,005
111 4,679,006

CLASS 333

17 M 4,679,007
21 A 4,679,009
21 R 4,679,008
109 4,679,010
111 4,679,011
161 4,679,012
182 4,679,013
195 4,679,014
219 4,679,015

CLASS 335

132 4,679,016
164 4,679,017
167 4,679,018
172 4,679,019
216 4,679,020
295 4,679,021
296 4,679,022

CLASS 337

140 4,679,023

CLASS 338

160 4,679,024
197 4,679,025

CLASS 340

63 4,679,026
347 CC 4,679,028
347 P 4,679,029
365 A 4,679,030
501 4,679,031
562 4,679,032
566 4,679,033
567 4,679,034
572 4,679,035
573 4,679,036
693 4,679,037
721 4,679,038
723 4,679,027
728 4,679,039
747 4,679,040
4,679,041
754 4,679,042
784 4,679,043
815.2 4,679,044
825.07 4,679,045

CLASS 342

51 4,679,046
52 4,679,047
61 4,679,048
172 4,679,049
196 4,679,050

CLASS 343

700 MS 4,679,051
712 4,679,052

CLASS 346

1.1 4,679,053
76 L 4,679,057
76 PH 4,679,054
4,679,056
140 R 4,679,058
4,679,059
159 4,679,060

CLASS 350

3.71 4,678,263
96.12 4,678,266
96.15 4,678,267
96.18 4,678,268
4,678,269
96.20 4,678,264
4,678,265
4,678,270
4,678,271
96.21 4,678,272
B1 4,257,674
96.30 4,678,273
96.34 4,678,274
4,678,275
247 4,678,276
319 4,678,278
320 4,678,279
4,678,280
331 R 4,678,281
334 4,678,282
340 4,678,283
344 4,678,284
345 4,678,285
356 4,678,286
404 4,678,287
432 4,678,288
486 4,678,289
506 4,678,290
510 4,678,291
609 4,678,292
4,678,293
611 4,678,294
634 4,678,295

CLASS 351

45 4,678,296
208 4,678,297

CLASS 352

62 4,678,298

CLASS 354

21 4,678,299
4,678,300
106 4,678,301
107 4,678,302
173.11 4,678,303
4,678,304
203 4,678,305
217 4,678,306
313 4,678,307
4,678,308
4,678,309
319 4,678,310

CLASS 355

1 4,678,311
3 R 4,678,312
4,678,313
5 4,678,314
7 4,678,315
14 C 4,678,316
14 D 4,678,317
15 4,678,318
38 4,678,319
49 4,678,320
52 4,678,321
133 4,678,322

CLASS 356

45 4,678,324
73 4,678,325
4,678,326
73.1 4,678,327
141 4,678,328
152 4,678,329
222 4,678,330
246 4,678,331
301 4,678,277
328 4,678,332
346 4,678,333
350 4,678,334
4,678,335
380 4,678,336
387 4,678,337
402 4,678,338

CLASS 357

4 4,679,061
22 4,679,062
30 4,679,063

CLASS 358

24 4,679,064
29 4,679,065
4,679,066
4,679,067
44 4,679,068
60 4,679,069
62 4,679,070
75 4,679,071
80 4,679,072
4,679,073
4,679,074
106 4,679,075
107 4,679,076
108 4,679,077
135 4,679,079
138 4,679,081
147 4,679,082
4,679,083
150 4,679,080
160 4,679,084
4,679,085
167 4,679,086
168 4,679,087
213.18 4,679,088
213.19 4,679,089
213.26 4,679,090
242 4,679,091
4,679,092
257 4,679,093
261 4,679,094
280 4,679,095
287 4,679,096
328 4,679,097

CLASS 360

10.1 4,679,098
10.2 4,679,099
15 4,679,100
60 4,679,101
75 4,679,102
77 4,679,103
78 4,679,104
97 4,679,105
99 4,679,106
113 4,679,107
130.31 4,679,108
132 4,679,109
4,679,110

CLASS 361

31 4,679,111
33 4,679,112
40 4,679,113
117 4,679,114
119 4,679,115
154 4,679,116
181 4,679,117
315 4,679,119
358 4,679,120
386 4,679,118
413 4,679,121
414 4,679,122
428 4,679,123
433 4,679,124

CLASS 362

66 4,679,125
226 4,679,126
294 4,679,127
306 4,679,128

CLASS 363

17 4,679,129
4,679,130
21 4,679,131
4,679,132
4,679,133
46 4,679,134
61

CLASS 364

146 4,679,135
150 4,679,136
188 4,679,137
200 4,679,138
4,679,139
4,679,140
4,679,141
406 4,679,142
412 4,679,143
417 4,679,144
424.1 4,679,145
426 4,679,146
449 4,679,147
473 4,679,148
478 4,679,149
479 4,679,150
510 4,679,151
513 4,679,152
523 4,679,153
525 4,679,154
4,679,155
551 4,679,156
557 4,679,157
559 4,679,158
560 4,679,159
563 4,679,160
571 4,679,161
4,679,162
725 4,679,163
728 4,679,164
760 4,679,165
900 4,679,166
4,679,167
4,679,168
4,679,169

CLASS 365

4 4,678,323
154 4,679,170
4,679,171
222 4,679,172
233 4,679,173

CLASS 366

76 4,678,339
111 4,678,340
142 4,678,341
186 4,678,342
349 4,678,343

CLASS 367

73 4,679,174
98 4,679,175
119 4,679,176
132 4,679,177
157 4,679,178
162 4,679,179

CLASS 368

69 4,678,344
119 4,678,345
157 4,678,346

CLASS 369

13 4,679,180
44 4,679,181
58 Re.32,457
77.2 4,679,182
84 4,679,183
112 4,679,184
255 4,679,185

CLASS 370

14 4,679,186
17 4,679,187
29 4,679,188
60 4,679,189
4,679,190
84 4,679,191
85 4,679,192
94 4,679,193

CLASS 371

16 4,679,194
29 4,679,195
51 4,679,196

CLASS 372

2 4,679,197
41 4,679,198
44 4,679,199
45 4,679,200
61 4,679,201
65 4,679,202
86 4,679,203
107 4,679,204

CLASS 373

84 4,679,205
91 4,679,206

CLASS 375

1 4,679,207
13 4,679,208
17 4,679,209
96 4,679,210

CLASS 376

156 4,678,618
173 4,678,619
203 4,678,620
245 4,678,621
259 4,678,622
260 4,678,623
261 4,678,624
4,678,625
298 4,678,626
313 4,678,627
333 4,678,628
419 4,678,629
438 4,678,630
444 4,678,631
462 4,678,632

CLASS 377

58 4,679,212
66 4,679,213
80 4,679,214
95 4,679,215
116 4,679,216

CLASS 378

97 4,679,217
101 4,679,218
121 4,679,219
132 4,679,220
148 4,679,221
166 4,679,222
195 4,679,223

CLASS 379

26 4,679,224
62 4,679,225
95 4,679,226
98 4,679,227
165 4,679,228
373 4,679,229
396 4,679,231
411 4,679,230
413 4,679,232
433 4,679,233
438 4,679,234

CLASS 380

15 4,679,078
20 4,679,235
23 4,679,236

CLASS 381

15 4,679,237
16 4,679,238
4,679,239
68.6 4,679,240

CLASS 382

13 4,679,241

CLASS 383

4 4,679,242

CLASS 384

43 4,678,347
114 4,678,348
125 4,678,349
208 4,678,350

CLASS 400

64 4,678,351
175 4,678,352
248 4,678,353
335 4,678,354
389 4,678,355

CLASS 401

95 4,678,356

CLASS 402

39 4,678,357

CLASS 403

28 4,678,358
170 4,678,359
353 4,678,360
359 4,678,361
373 4,678,362

CLASS 404

75 4,678,363
105 4,678,364
118 4,678,365

CLASS 405

3 4,678,366
39 4,678,367
118 4,678,368
129 4,678,369
154 4,678,370
164 4,678,371
196 4,678,372
230 4,678,373
261 4,678,374
270 4,678,375
4,678,376

CLASS 406

139 4,678,377

CLASS 408

46 4,678,378
83.5 4,678,379
211 4,678,380

CLASS 409

221 4,678,381
232 4,678,382

CLASS 411

32 4,678,383
43 4,678,384
456 4,678,385
468 B1 3,951,033

CLASS 412

8 4,678,386

CLASS 414

47 4,678,387
92 4,678,388
267 4,678,389
282 4,678,390
389 4,678,391
563 4,678,392
751 4,678,393

CLASS 415

2 R 4,678,394
53 T 4,678,395
148 4,678,396
151 4,678,397
181 4,678,398
199.2 4,678,399
199.4 4,678,400

CLASS 416

32 4,678,401
157 R 4,678,402

CLASS 417

12 4,678,403
45 4,678,404
245 4,678,405
310 4,678,406
341 4,678,407
410 4,678,408
420 4,678,409
423 R 4,678,410
500 4,678,411

CLASS 418

26 4,678,412
29 4,678,413
45 4,678,414
50 4,678,415
55 4,678,416

CLASS 419

8 4,678,633
30 4,678,634

CLASS 420

449 4,678,635
456 4,678,636
490 4,678,637

CLASS 422

13 4,678,638
56 4,678,640
81 4,678,639
101 4,678,641
144 4,678,642
175 4,678,643
186.05 4,678,644
190 4,678,645
245 4,678,646

CLASS 423

96 4,678,647
228 4,678,648
308 4,678,649
309 4,678,650
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72 4,678,665
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93 4,678,669
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04 :	290,730		290,740		290,765		290,739	34 :	290,661		290,725
06 :	290,662		290,754	13 :	290,671		290,770		290,669		290,726
	290,664		290,756		290,692		290,771		290,766		290,778
	290,665		290,777	17 :	290,670		290,772		290,767	41 :	290,660
	290,674	08 :	290,679		290,673		290,774	36 :	290,704	42 :	290,666
	290,703	09 :	290,762		290,680	25 :	290,710		290,708		290,685
	290,706	10 :	290,668		290,688		290,764		290,751		290,741
	290,707		290,689		290,763	26 :	290,702		290,760	48 :	290,747
	290,709										
	290,716	12 :	290,744	18 :	290,731		290,779		290,761	51 :	290,678
	290,718		290,745		290,736	27 :	290,684		290,768	55 :	290,691
	290,728		290,746		290,737	30 :	290,769	37 :	290,672		290,696
	290,729		290,750		290,738	33 :	290,717	39 :	290,724		290,773

STATUTORY INVENTION REGISTRATIONS

01 :	H299	06 :	H300		H303	24 :	H309	47 :	H298	48 :	H296
	H306		H307		H304	39 :	H297		H301		
	H311	17 :	H302	19 :	H313		H310		H305	49 :	H312

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